Texas Tech University
Academic Council
Meeting of September 21, 2010
1:30 PM, Provost's Conference Room

AGENDA

1. Minutes of August Meeting
2. Early Registration for SGA Senators (Shonrock & Myants)
3. KTXT-TV Challenge Program (Pitts)
4. Certificate Proposals (Elbow)
    a. Digital Design and Fabrication (attached)

    b. College Student Counseling (attached)

5. Course proposals (Jones; attached)
6. Core Curriculum Additions and Deletions (Elbow; attached)
7. Course Change and Proposal Guidelines (Elbow; attached)
8. Calendar Issues (Jones)
9. Information Items
    a. VPA BGS (Henry)

    b. ED.D. in Education Leadership at Angelo State (Johnson; Paton)

10. Announcements/Other

Adjourn by 3:00

ACADEMIC COUNCIL

Texas Tech University

Meeting of
August 27, 2010

MINUTES

Present: Wendell Aycock, Bruce Bills, Wesley Cochran, Cathy Duran, Gary Elbow, Drew Graham, Sheila Hoover, Norm Hopper, Lynn Huffman, Patrick Hughes, Jorge Iber, Peggy Johnson, Sue Jones, Bob Schaller for Bobbie Latham, Deborah Lavrie, Ethan Logan, Pat McConnel, Joshua Barron for Juan Munoz, Walt Oler, Valerie Paton, DaNay Phelps, Beverly Pinson, Marjean Purinton, David Roach, Brian Shannon, Brian Steele, Rob Stewart (chair), Kevin Stoker, Janessa Walls, Vicki West

Guests: Julie McCauley, Jan Childress, Evelyn McPherson, Elizabeth Massengale, Jenna Pool, Ken Rainwater, Michael Shonrock, Carrye Syma

Pool from Student Health Services gave a presentation on a new program called AlcoholEdu, which is an online, research-based alcohol responsibility program for first-year freshmen during their fall semester. This program provides a tailored educational experience focusing on the impact of alcohol on the mind and body. Student Health Services is targeting a 95 percent completion rate. To improve the student completion rate of the program, Pool proposed that the university block the ability of students to view their final grades if they have not completed the Alchoholedu course. Implementation would begin fall 2010. Duran moved the proposal be accepted, Huffman seconded the motion, and the motion passed. Because the council felt that transfer students may be experiencing alcohol issues similar to freshmen, Ellis moved that the AlcoholEdu program also be offered to transfer students beginning in fall 2011. Hopper seconded the motion and the motion passed. After additional discussion, Huffman moved that the program also be offered in the spring beginning in 2011, Stoker seconded the motion, and the motion passed.

The Academic Council reviewed the minutes from July 17, 2010. Roach moved to accept the minutes as presented, Aycock seconded the motion, and the motion passed.

Rainwater gave a brief overview of the new proposed Master of Science in Arid Land Studies. This proposed degree, which will be administered by the Graduate School, is already a track within the master's in Interdisciplinary Studies. This will be a formal academic program to support the university's International Center for Arid and Semiarid Land Studies. Purington moved the proposal be accepted, Cochran seconded the motion, and the motion passed. Paton reminded the council that the program cannot be implemented until after the Board of Regents approves the program and the university receives acknowledgement letters from THECB and SACSCOC.

Paton requested that if anyone should receive a request or document from THECB, please forward the correspondence to her office and she will ensure it is answered.

Syma asked council members for feedback concerning their impressions of the August commencement exercises. After a discussion of what improvements were effective and what issues should be addressed in the future, Elbow asked council members to email him with any additional suggestions or concerns.

Duran initiated a discussion of using "PR" as a semester grade for undergraduate carry-over courses. After extensive discussion, Schaller assured the council that the grade is already available in Banner for undergraduates.

Huffman expressed concern that current policies make it more economical for departments to use adjunct professors than graduate students to teach classes. She questioned the impact this will have on our graduate program.

Stewart noted that 2010-11 Consulting and Outside Employment forms are due on October 25. The forms will be more specific this year as a result of the university's concern over faculty members teaching courses at competing for-profit institutions. Provost Smith recently had an OpEd piece published in the *Houston Chronicle* regarding this issue. His article expressed concern that this practice is a conflict of interest, particularly if the course is in the course inventory of the state institution and if the faculty member is teaching for the for-profit institution during an academic year appointment with the state.

Other business brought before the council included the following:

- The due date for Faculty Development Leave submissions has been changed to October 11.
- Stewart will meet with Kyle Clark on August 19 regarding summer incentive funding.
- Law School flipbook has been uploaded to Official Publications website.

DDF

DDF
Digital Design and Fabrication
College of Architecture
Texas Tech University
Certificate
Proposal

Texas Tech University
College of Architecture
Certificate in Digital Design and Fabrication

Summary

The College of Architecture's Certificate in Digital Design and Fabrication (DDF) is dedicated to advance design knowledge and pursue innovation in the process of making architecture. The program is positioned at the intersection of architecture, engineering and computation with a profound sustainable and interdisciplinary direction. The program expects to develop applied research approaches that concern emerging material issues in a "digital-craft" based professional practice.

With a focus on digital technologies, the program explores new material processes across different fields and the related fabrication and building methodologies. The goal is to form a set of skills, which build up a designer's creative potential through material oriented strategies. Research models and innovative approaches are in direct response to questions of inquiry brought forward through our network of partners in professional practice. The program is intended to prepare students for recent market changes with an exponential increase in digital and information-driven design-build projects.

Market changes in Architectural Practice

A change in the process of architecture through the technological evolution of "drawings" is occurring today, but in contrast with the renaissance, it is reconfiguring the whole building industry, involving the architect in an emerging networked team of design and construction specialists. New communication and knowledge exchange techniques supported with information technology (IT) are disrupting time frames and spatial relationships between key players and facilitating inclusiveness and collaborative project delivery. The *cyberarchitect* in the new role of the integrative generalist or design specialist forms part of the emerging creative class, to use a term suggested by Richard Florida of Carnegie Mellon University.

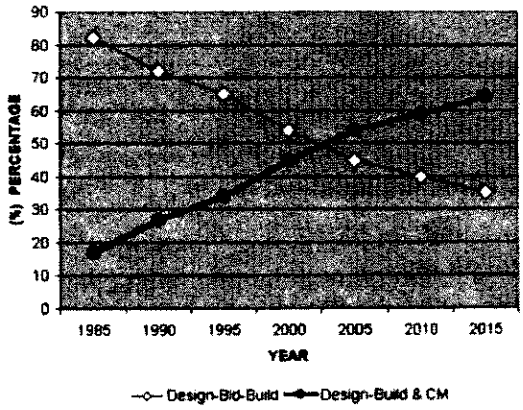


Fig.1 Source: Design Build Institute of America – Susan Williams, September 2000

The current project delivery process in the construction industry in the US, is shifting from a traditional *design- bid- build* process to a streamlined *design- build* process (Fig.1). This emerging trend is supposed to become more dominant in the years to come in particular driven by new market players such as design engineering firms and media savy construction developers. Individual architecture firms not ready for this change will ultimately fall behind,

unless they deliberately follow up by engaging new expertise in the field of computational design related to fabrication and construction technology advances. The innovative "design + build" process, inspired by the automotive industry, is no more a linear single-event procedure, but instead is focused on collective problem solving in a central 4D digital master model. With this model, simultaneous multi-events are modified and subjected to performance simulations early in the design phase. The emerging common building information model (BIM) is the architectural implementation of such a process (Fig.2) and is universally accessible and parametrically organized in a way to accompany the building from its digital inception through the entire building life cycle.

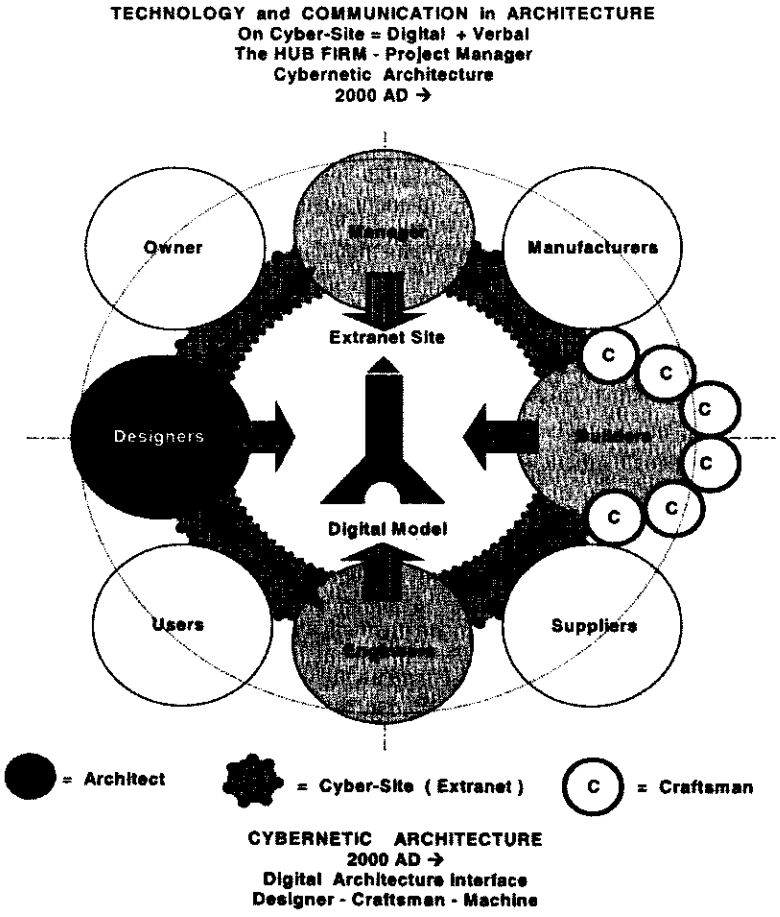


Fig.2 Source: Barrow, L, Acadia Proceedings 2002

The *digital design and fabrication* certificate is therefore intended to respond dynamically to these recent market changes by offering courses that provide knowledge directly related to digital and information-driven design-build projects. Students develop a set of skills geared towards a "digital-craft" based professional orientation with emphasis on design techniques, advanced material processes and fabrication methodologies.

DDF Program Information

In general there are three areas of teaching and research which complement each other and define the certificate in *digital design and fabrication*: Design, Fabrication and Construction (Fig.4). The program offers courses that deepen knowledge in those three areas closely related to recent and emerging technologies that reshape the current practice of architecture and the construction industry as a whole.
The certificate's focus is on computational design techniques and a material-based process taught through specific courses with the goal to be implemented into the design studio projects within the College of Architecture, but also later into professional practice. With the introduction to fabrication concepts, students are given hands-on experience with Computer Aided Manufacturing (CAM) software and computer numerical processes complemented by experiments with state of the art technology in the lab.
The selected courses such as *design process* or *computer applications in architecture*, provide a theoretical basis and skill development in creative computational modeling, digital design strategies and emergent technologies. Emphasis is on the generative development of form, computing in terms of *formfindung* (formfinding) and extending to the performance and behavior of resulting structures and geometries.
Other courses such as *smart materials* or *product design*, provide additional expertise in experimental techniques related to advanced material research and innovative methods of assembly (Fig.3).

Courses Number	Course Title Course Offering	Name of Core Faculty
Arch 5303	Smart Materials	Assoc.Prof
		Perbellini
ARCH 5304	Generative Design	Assoc. Prof.
		Pongratz
ARCH 5361	Architectural Theory	Assoc.Prof.
	Seminar	Neiman
ARCH 5352	Computer Applications	Assis. Prof.
	to Architecture	Park
Arch 5302	Product Design	Assoc. Prof.
	Workshop	Flueckiger
ARCH 5334	Advanced Studies in	Assoc. Prof.
	Construction Technology	Pongratz

Fig.3 digital design and fabrication (ddf) courses

All courses provide the necessary set of skills to be applied in design research experiments which may branch out into diverse fields of scientific research.
It is the challenge of the DDF program to stimulate research in new design processes and techniques (from bio-ecological to nano-technological), where the material and product-based outcome is simulated at the industrial fabrication stage through prototyping and the determination of innovative aspects during the assembly phase. While it helps the students to gain experience with the latest manufacturing technologies (in particular the use of computer numerically controlled equipment such as routers, laser cutters, and other machinery), the program provides the additional opportunity to investigate potentially new building systems by way of prototyping small to full scale components. The digital design and build process is based on precise descriptions, which are driving the fabrication of building products through parametric instructions fed directly into the respective machines. Through the exploration of these

parametric strategies, this highly informed process can influence the way architects design, in particular because the new techniques allow one to judge the performance of models and their variations in direct response to material implications. Recent concepts of mass customization and variability in manufacturing in architecture are therefore issues to be critically reviewed through design research in various seminars.

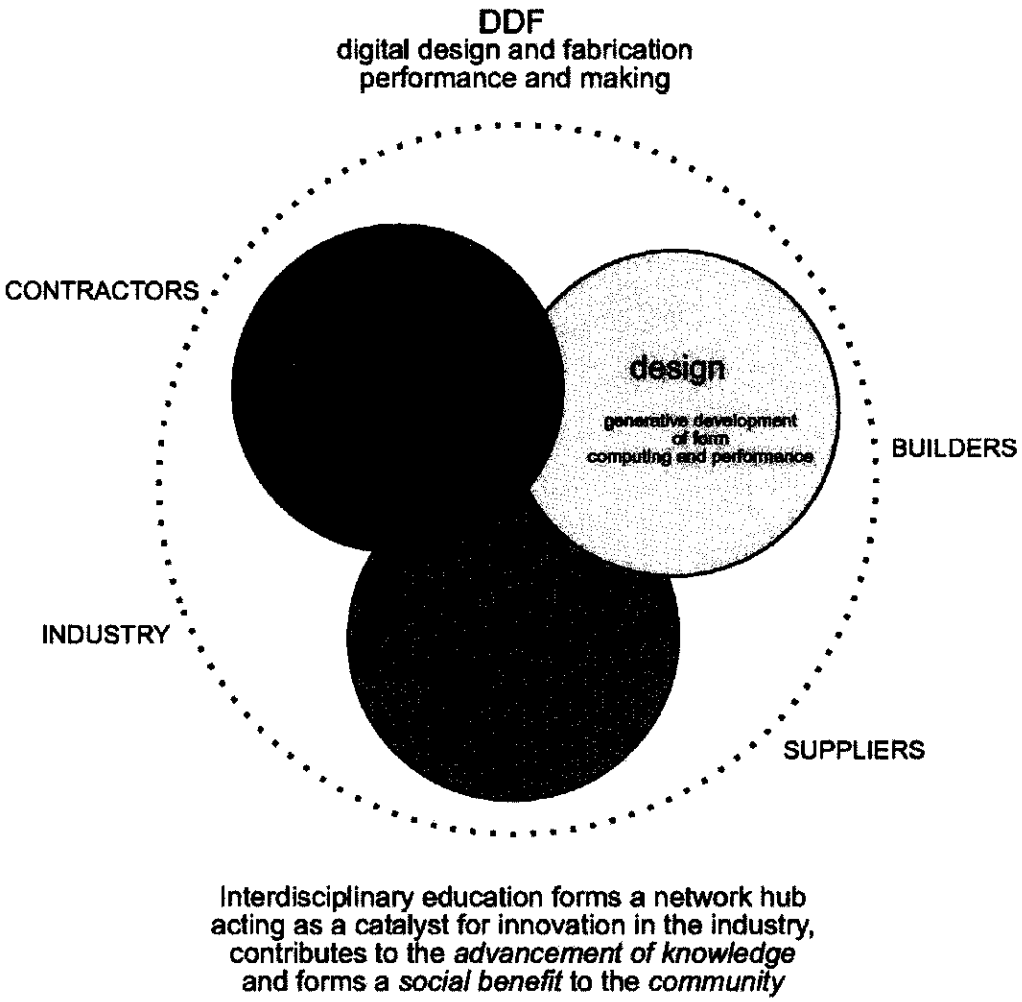


Fig.4 Design Research Sector Diagram , Christian R Pongratz, 2007

The idea is to create a think tank embedded in strategic, interdisciplinary collaborations with other colleagues and colleges on and off campus in order to incubate new ways of research and engage in projects related to current faculty research. Currently the faculty involved in the program forms part of common research projects with IE and CE. There is strong interest across various Colleges and departments such as the School of Art to collaborate in emerging fabrication methodologies. Students in the ddf certificate program will also engage in and organize workshops, symposia and publications to bring their research findings to the forefront of ongoing debate in the architectural field.

Certificate Requirements

The ddf certificate is an educational component of the Master of Science in Digital Design and Fabrication. Both the Master of Science and the Certificate make up the Digital Design and Fabrication Program. A minor or certificate of specialization can be obtained by graduate students in other programs by taking the 15 hours of core courses in the DDF program (Fig.5).

MArch students wanting to earn the certificate are required to complete the 15 core course hours in addition to required courses for completion of that degree. MArch graduates who wish to pursue the MS Degree after receiving the MArch with the certificate may transfer in only six hours from the MArch certification and must the complete 38 hours of approved course work to receive the MS Degree.

BSArch students can take up to nine hours of the certification within the last eighteen hours of undergraduate study. These hours can be transferred toward the MS Degree if these nine hours are not used to fulfill the undergraduate degree requirements. BSArch students can also opt to take these nine hours as undergraduate electives within the last eighteen hours of BSArch coursework as counted elective courses, and complete an additional six hours of certification core courses after graduation, to receive the certificate. If BSArch students wish to pursue the MS Degree later, only six hours of the certificate hours can be transferred and the student must complete an additional 32 hours of course work.

Any student enrolled at TTU in any school or college can earn a certificate, as a Bachelor, Master, or PhD degree candidate under the same guidelines above having been accepted into the certificate program offered by the College of Architecture. The certificate is awarded only after completion of a first degree.

Category	Semester Credit hours
Required Courses	9
Elective Courses	6
Total	15

Fig.5 Breakdown of credit hours requirements for the ddf certificate

The nine SCH credit hours that are required consist of graduate level architectural courses that cover necessary computational and material related skills and are offered from the ddf core faculty. See (Fig.6) below for required courses.

Courses Number	Course Title Course Offering	Name of Core Faculty	SCH
ARCH 5303	Smart Materials	Assoc.Prof	3
		Perbellini	
ARCH 5304	Generative Design	Assoc. Prof.	3
		Pongratz	
ARCH 5352	Computer Applications	Assis. Prof.	3
	to Architecture	Park	

Fig.6 Required courses for the ddf certificate

The prescribed elective requirement for the certificate consists of six SCH. These courses cover one additional computational research course and two courses on advanced construction and product design (Fig.7).

Courses Number	Course Title Course Offering	Name of Core Faculty	SCH
ARCH 5302	Product Design	Assoc. Prof.	3
	Workshop	Flueckiger	
ARCH 5334	Advanced Studies in	Assoc. Prof.	3
	Construction Technology	Pongratz	
ARCH 5361	Architectural Theory	Assoc.Prof.	3
	Seminar	Neiman	

Fig.6 Prescribed elective courses for the ddf certificate

Each student must choose two courses out of the list of prescribed elective courses listed in the table above.

DDF courses, catalog descriptions:

Smart Materials, ARCH 5303, - Study of emerging materials, and how properties and performances affect design thinking. Investigation of advanced technologies facilitating design innovation in building components and their assemblies.

Generative Design, ARCH 5304, - Generative Design (3:3:3). Explores emerging methods of computation as generative drivers of the design process, where design intent captured through algorithmic processes and parametric modeling enables design alternatives.

Computer Applications in Architecture, ARCH 5352, - Computer Applications to Architecture (3:3:0). Survey of digital computer applications to the issues and processes of architecture and planning. May be repeated for credit.

Product Design Workshop, ARCH 5302, - Product Design Workshop (3:0:6). Introduction to the design and executed construction of a prototypical piece of furniture or other design product using an architectural design process. F.

Advanced Studies in Construction Technology, ARCH 5334, - Advanced Studies in Construction Technology (3:3:2). Prerequisite: ARCH 3355. Approved technology elective dealing with the advanced study of technical building methods and means.

Architectural Theory Seminar, ARCH 5361, - Architectural Theory Seminar (3:3:0). Architecture as art, science, and a contemporary philosophical concept. Exploration of context and goals. Illustrated lectures. May be repeated for credit.

DDF Faculty:

The proposed certificate in digital design and fabrication will have five core faculty members. All of the listed faculty have terminal degrees and are tenured or tenure-track, and devote 25% of their time to teaching the courses listed.

Name of Core Faculty and Rank	Course Title Course Offering	Courses Assigned in Certificate	% Time Assigned to Program
Assoc.Prof	Smart Materials	Arch 5303	25%
Maria Perbellini			
Assoc. Prof.	Generative Design	ARCH 5304	50%
Christian Pongratz			
	Advanced Studies in	ARCH 5334	
	Construction Technology		
Assoc.Prof.	Architectural Theory	ARCH 5361	25%
Bennett Neiman	Seminar		
Assis. Prof.	Computer Applications	ARCH 5352	25%
Kuhn Park	to Architecture		
Assoc. Prof.	Product Design	Arch 5302	25%
Upe Flueckiger	Workshop		

Fig.7 core faculty participants for the ddf certificate

DDF Courses Schedule:

The anticipated dates for offering various courses from the course lists above are presented below:

Courses Number	Course Title Course Offering	Time scheduled
Arch 5303	Smart Materials	Fall 2010
ARCH 5304	Generative Design	Fall 2010
ARCH 5361	Architectural Theory	Fall 2010
	Seminar	
ARCH 5352	Computer Applications	Spring 2011
	to Architecture	
Arch 5302	Product Design	Spring 2011
	Workshop	
ARCH 5334	Advanced Studies in	Spring 2011
	Construction Technology	

Fig.8 courses scheduled in the coming semesters for the ddf certificate

Facilities and Equipment:
http://arch.ttu.edu/wiki/Ddf_lab

For additional information, please see the DDF webpage at:
http://arch.ttu.edu/wiki/Digital_Design_Fabrication_M.S.

Contact:
Program Director
Assoc. Prof. Christian R. Pongratz
Ph: (806) 742 -3136 X226
christian.pongratz@ttu.edu

DDF Course descriptions:

DESIGN:

1. ARCH 5352 Design Computing (Park) (catalog:Computer Applications to Architecture)

DECO (DEsign COmputing) introduces design as a computational enterprise in which mediating technologies are developed to compose and describe architecture and designs. The course opens with the novel idea of design computing as a creative act in architecture. Moreover, in the course investigators create a design world that is based on language, modern logic, and fundamentals of cognitive science to address the notion of generation in computational design. The course covers topics such as mathematics in design/architecture, design by number, media art, shapes, modern logic, the notion of language, cognitive science, shape arithmetic, symmetry, spatial relations, action & reaction, human & computer interaction, shape computations, shape grammars, and physical computing. Hands-on design exercises and projects are continually framed and examined in the larger context of current digital and physical technologies in computing.

2. ARCH 5304 Generative Design (Pongratz)

This course is an intensive introduction dedicated to advanced computing and parametric modeling. It will explore digital processes of design related to the intellectual conceptualization and development of *formfindung* in Architecture. Investigating topics such as, generative natural systems, the history of evolutionary morphological processes of form development and their resulting geometrical changes is expected to trace a relationship with emerging computational models of form generation. A particular field of computational techniques coupled with a conceptual research theme may be determined by the instructor each semester, such as the discreet variation and modularization of surfaces in relationship to the theory of *difference and repetition*, *formgebung* versus *formfindung*, generative design, evolutionary design, genetic algorithms, component assembly in nature and their self-organizing potentials.
Authors and architects discussed include D'Arcy Wentworth Thompson, Robert Le Ricolais, G. Bateson

Methodology of inquiry: Recent algorithmic processes introduced with scripting techniques in several software packages (MEL, GH, DP, GC etc.), allow for control, variation and differentiation of design strategies through parametric definition and scheduled intelligence. Instead of linear processes being employed in the design development process as in the past, chance and performance occur simultaneously, which permits us to address current necessities with inclusive design strategies. The exploration of relationships and dependencies of objects with programmed loops and open "what if" conditions maximizes the exploration of a large number of variations within reduced time restraints. The course is intended to explore with small exercises the different steps involved with programming concepts. With increasing competency, individual paths and programs will be developed which experiment with the potential of parameter changes and environmental influences on the system.

3. ARCH 5361 Analog-Digital Constructions (Neiman) (catalog: Architectural Theory Seminar)

This design seminar investigates the strategies, tactics and techniques of form making with a particular emphasis on design fabrication. The work is exploratory in nature and proceeds unfettered by the conventions of practical application in order to discover the unexpected that could radically alter our understanding of the practical. The creative techniques presented give students a procedural foundation for the integrated use of physical material and digital tools in a

design process. The course features design discussion and critiques of design and fabrication work, supplemented by procedural demonstrations and workshop sessions. Both analog and digital assignments are completed outside of class time.

The specific objective is for student teams to design, document, fabricate, paint and assemble a series of large-scale, three-dimensional, physical relief models translated from pre-existing two-dimensional compositions. Several overlapping processes are engaged as follows:

1. Design: analog design configurations developed and translated to digital 2D construction templates.
2. Measuring Model: an analog tool for calibration of layered and vertical components.
3. Virtual Model: a working 3D digital model produced from vector-based template files.
4. Fabrication: laser cutting of model parts from vector-based template files.
5. Assembly: laser cut parts are painted and assembled.
6. Documentation: scanning and photography of the entire process.
7. Display: exhibition or publication of models, drawings and process photos.

Required Software: formZ, bonzai3D, Adobe Photoshop and Illustrator.

FABRICATION:

4. Arch 5303 Smart Materials (Perbellini)

The course will study emerging material practices from building component design to interactivearchitecture and smart design. The focus is on the exploration of properties of materials with the goal to understand the potential for innovation through a "smart application" in contemporary building design. The research investigates material components that may form an intelligent sustainable system by using their physical characteristics. Recent research driven products of the industry like self-cleaning glass, anti pollution pavement, or shape memory alloys will be further explored in their application potential. Students will engage in analysis, research and development of design, engineering and manufacturing of innovative and high performance building components and envelopes. The course will engage in the questions of how materials may have different rarely applied properties and how this changes the range for new applications in building design.

5. ARCH 5334 Building Skins (Pongratz Only) (catalog: Adv Stds in Construction Tech)

The course on building skins will engage students in research and development of fabrication strategies and material processes, and explore the potential for innovation in building components and their assemblies. In addition, it will focus on the workflow between design concept in the generative modeling phases and design output to fabrication, such as the transfer to rapid prototyping and other numerically controlled machines. Students will be introduced to CAD/CAM environments, the concept of file-to-factory, and study the flow of projects in solid modeling and parametric software packages. An initial part of the course is dedicated to the analysis of design, engineering and manufacturing constraints related to innovative and high performance building envelopes. Case studies will explore the design of façade typologies through contemporary manufacturing methodologies and with regard to the materials of various cladding systems. Materials range from high-strength concrete, stone composites, extreme textiles to latest polymer and fiber composites.
Each year the course will focus on a specific topic of material inquiry selected by the instructor. The notion of non-standard production will be explored through a material system driven research in two phases, surface design and assembly design.

Students will be given a hands-on experience from small scale models to large scale mockups in different methods of fabrication, exploring material resistances and employing the equipment of the digital design and fabrication laboratory.

Readings include works by Frei, Fuller, Piano, Sobek and others.

CONSTRUCTION:

6. Arch 5302 Product design Workshop II (Flueckiger) (catalog: Product Design Workshop)

Introduction and development of contemporary product design and prefabricate housing with emphasis on digital fabrication process. Making of a prototypical design product/model applying digital fabrication technology.

Application for Graduate Certificate Program
COA ddf digital design and fabrication

1. Name of Graduate Certificate Program.
Digital Design and Fabrication (ddf)

2. Name of home department and home college.
College of Architecture

3. Graduate advisor(s) for graduate certificate program (admissions and advising).
Christian R Pongratz

4. Required courses and electives (specify each)
Certificate requirement is 15 SCH in 5 courses, three required and the student needs to choose 2 additional courses out of three elective courses:

ARCH 5361, ARCH 5302, ARCH 5334

Courses & Titles	Frequency of Course Offering	Prerequisites	Elective (E) Required (R)	Taught by Distance
ARCH 5303				
Smart Materials	Fall	No	R	No
ARCH 5304	Fall	No	R	No
Generative Design				
ARCH 5361	Fall	No	E	No
Architectural Theory				
Seminar (Neiman)				
ARCH 5352	Spring	No	R	No
Computer Applications				
to Architecture				
ARCH 5302				
Product Design	Spring	No	E	No
Workshop				
ARCH 5334	Spring	No	E	No
Advanced Studies in				
Construction Technology (Pongratz)				

Application for Graduate Certificate Program
COA ddf digital design and fabrication

5. Are all courses currently available? If not, the applications for new courses must accompany this proposal.

New courses are: **ARCH 5303 Smart Materials; ARCH 5304 Generative Design**

6. What workforce needs (or creative needs) are being met by the establishment of the proposed graduate certificate program? **In Architectural practice, traditional paper based methods of documenting and delivering architectural projects is increasingly challenged by innovative, complex designs and new materials. Practitioners will be more forced in the future to initiate new ways of thinking about architecture and building, while using advanced 3D technologies to design but also reduce paper documentation and directly from design to construction. In parallel, a proliferation of dynamic associative design environments and the convergence of distributed design sensibilities foster innovations towards project delivery and establish more collaborative project teams. These are conducting practice through integrated 3D project data from design to fabrication. The construction industry will expand with growing demands in manufacturing and the building market is expected to streamline towards computation and advanced manufacturing. Inclusive building information modeling necessitates a As a consequence , future architects will need to be able to not only communicate but understand and apply advanced fabrication methods. The program is intended to prepare students for these recent market changes with an exponential increase in digital and information-driven design-build projects. (see also DDF Certificate Proposal document)**

How many students per year do you anticipate using the program?

10+ students

How was the above information determined?

Application forms distributed to current graduate entry student group

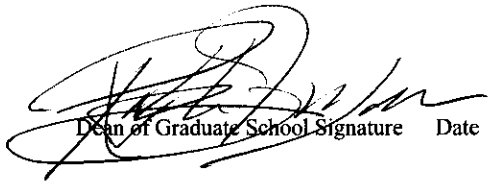
7. What impact will the program have on your existing graduate degree programs?

The faculty of the ddf certificate does not teach any course in the other existing graduate certificate degree programs.

8. Do you have any existing graduate certificate programs?

- **Historic Preservation**
- **Visualization**
- **Community Planning**
- **Health Care Facilities (HCaF) Design**

Application for Graduate Certificate Program
COA ddf digital design and fabrication

	06.14.10	MICHAEL PETERS
Dean of College Signature	Date	Typed or Printed Name
	6-14-10	GARY W. SMITH
Department Chair Signature	Date	Typed or Printed Name
		RALPH FERGUSON
Dean of Graduate School Signature	Date	Typed or Printed Name
Provost Signature	Date	Typed or Printed Name

TTUfall10 generativeDESIGN syllabus arch5304

Office: 705 C
Email: Christian.Pongratz@ttu.edu
Studio location: 601
Phone: 806-742-3169-226
Course time:
T>9-11.50 A.M.
Office Hours:
W 10-11 A.M. **Note:** please make appointment ahead of time via email
Server:
\\archlab\arch_5304_FA10_Pongratz

Course Instructor: Christian R Pongratz

Course Information: ARCH 5304
Generative Design
Credits: 3 semester credit hours

Catalog description
Generative Design (3:3:3). Explores emerging methods of computation as generative drivers of the design process, where design intent captured through algorithmic processes and parametric modeling enables design alternatives.

Course purpose:

This course is an elective class and part of the digital design and fabrication certificate. It is a digital design media driven class, where technology is used to teach specific design research skills. Class assignments and exercises will inquire how to define research that supports design innovation in contemporary practice. Students that gain insight into the deep knowledge which informs innovative design strategies, learn on how to reflect on the results and are able to creatively apply it to other design projects.

Course description:

This course is an intensive introduction dedicated to advanced computing and parametric modeling. It will explore digital processes of design related to the intellectual conceptualization and development of *formfindung* in Architecture. Investigating topics such as, generative natural systems, the history of evolutionary morphological processes of form development and their resulting geometrical changes is expected to trace a relationship with emerging computational models of form generation. A particular field of computational techniques coupled with a conceptual research theme may be determined by the instructor each semester, such as the discreet variation and modularization of surfaces in relationship to the theory of *difference and repetition*, *formgebung* versus *formfindung*, generative design, evolutionary design, genetic algorithms, component assembly in nature and their self-organizing potentials.

General Methods: Arch 5304 is an advanced computational course that requires a substantial dedication and investment of student time, skill, and critical thought both during and after official class hours. As a part of instruction, students are required to participate in all lectures, discussions, and where scheduled workshops, as well as group and individual critiques of assignments.

Methodology of inquiry: Recent algorithmic processes and scripting techniques in several software packages (MEL, GH, DP, GC etc.), allow for control, variation and differentiation of design strategies through parametric definition and scheduled intelligence. Instead of linear processes being employed in the design development process as in the past, chance and performance occur simultaneously, which permits us to address current necessities with inclusive design strategies. The exploration of relationships and dependencies of objects with programmed loops and open "what if" conditions maximizes the exploration of a large number of variations within reduced time restraints. The course is intended to explore with small exercises the different steps involved with design logic, parametric and programming concepts. With increasing competency, individual methods, paths and programs will be developed which experiment with the potential of parameter changes and environmental influences on the system.

Learning Outcomes:
Upon completion of this course the student will gain the following abilities:

Design process
Ability to develop a methodology of formal exploration and expression as a source of ordering systems and examine its potential to generate spaces. Understand rule-based logic inherent in architecture and demonstrate the codification of the design intention.

Design Research Skills
Ability to formulate design research concepts and gather, assess, record, evaluate and apply relevant information into architectural design work.

Digital Design / Media
Ability to use appropriate digital media and technology in the design and building process, including but not limited to emerging computational methods.

Computers: Latest student computer minimum specifications are available at http://www.arch.ttu.edu/architecture/computers.asp Technical difficulties, viruses, crashes, server and print bureau problems, or corrupted files will not be accepted as legitimate excuses. ALL WORK SHOULD BE CONTINUOUSLY SAVED AND REGULARLY BACKED UP. All work must be printed before class to be considered timely. Class time will not be used for printing.

Software: Software requirements will be given by the instructor at the beginning of the class. Students are to purchase student software licenses in the case these are not provided by the College of Architecture. Typically these are latest parametric design programs and afford additional study outside of class time.
Students may further be required to participate in workshops as indicated by the instructor. In the case additional outside instructors are invited to participate in workshops or group instruction an additional workshop fee will be established or added as a course fee.

Recommended Texts:
determined by the semester topic and instructor

- H. Pottmann, A. Asperl, M. Hofer and A. Kilian: Architectural Geometry. Bentley Institute Press (2007), 724 pages, 2200 figures in color, ISBN 978-1-934493-04-5.
- Landa de M, *A thousand years of nonlinear history*, Swerve Editions, 2000
- Landa de M, *Intensive Science and virtual philosophy*, Continuum, 2002
- Terzidis K., *Algorithmic Architecture*, Architectural Press, 2006

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· Silver M., *Programming Cultures*, AD, 08 2006
· D'Arcy Wentworth Thompson, *On Growth and Form*, Cambridge Press, 1992
· Hersey George L., *Architecture and Geometry in the Age of the Baroque,* University of Chicago Press, 2000

Field Trip Requirements:
All students are required to attend field trips if scheduled. Permission sheet will be signed beforehand. Attendance will be taken. There might be optional field trips at the instructors discretion.

Additional Requirements:
There may be additional requirements, required materials, readings, and references as the semester progresses indicated by the instructor.

Academic Integrity:
It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. As such, the College of Architecture follows the university academic regulations pertaining to Cheating and Plagiarism as set forth in the Undergraduate and Graduate catalog, 2003-2004, page 49. Additionally, refer to the *Student Affairs Handbook* for the University definition and policy regarding plagiarism, disciplinary sanctions, conditions, and restrictions.
Plagiarism includes offering the work of another student as one's own, work drawn, made or designed by another student or design work copied from any other person and source without full and clear acknowledgement. It is quite OK to use precedent as long as you give attribution. Students are expected to have done the work that is claimed as their own. **As a matter of course, you will acknowledge your sources with the appropriate footnote or endnote.**

Attendance Policy: The College of Architecture follows the class attendance policy set out in the Undergraduate Catalog, 2004-2005. Students are responsible for attending class. Four absences are considered excessive and constitute cause for having the student drop the class or receive a grade of "F". Whether absence is excused or unexcused is determined solely by the instructor with the exception of absences due to religious observance and officially approved trips in the semester. Students are expected to comply with TTU rules for reporting student illness requiring absence from class for more than one week or immediate family deaths. Students are required to work in class during class hours. Work in class requires students to have their computer, printer, drawing tools, materials and supplies available at all times. Work includes participation in pinups, lectures, and discussions. **Note:** *Failure to work in class with undivided attention, the lack of appropriate tools and materials, any tardiness, leaving early, lack of participation, general socializing, goofing around, disruptive behavior, etc. will be regarded as absences. You are not allowed to work on assignments from other classes during this class.*

Civility in the classroom: Students are expected to assist in maintaining a classroom environment (during or after hours) that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited in engaging in any other form of distraction.

Inappropriate behavior in the classroom shall result, minimally, in a request to leave the class.

Room requirements: Class room - keep the class doors locked at all times
Students need to comply with Architectural building policy.

ADA, Equal Opportunity and Access to Facilities:
The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from Disabled Students Services, Dean of Students Office. No requirement exists that accommodations be made prior to completion of this approved University process. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. Contact office 335, West Hall, or 806-742-2405.

Academic Regulations: Please consult the Texas Tech University 2004-05 Catalog, (pp. 52-56) for information about *Semester Hours and Course Loads, Dropping a Course, Class Attendance, Reporting Illness, Absence Due to Religious Observance, Academic Integrity, Civility in the Classroom*, and *Grading Practices; Equal Opportunity statement is on p. 2.* Students must comply with ALL requirements of the **Architecture Building Policy** posted on the college web site at http://www.arch.ttu.edu/Architecture/

Methods for Assessing the expected Learning Outcomes:
The expected learning outcomes will be assessed through: Finished assignments and home work (25%), research presentations (15%), participation in class discussions and readings (15%), final research project (30%), final documentation (15%), are forming the final grade. Non-graded quizzes and response papers or other techniques may be used additionally for accessing student learning outcomes. Production and hard work lead to improvement. There will be individual and/or team assignments. This is not a quantifiable, exact, or mathematical assessment.

Assignment Requirements: Each assignment will have specific requirements and deadlines. All Assignments must be completed in a timely manner. All assignments are considered late if they are not submitted at the beginning of class the day they are due. For each day (not including weekends) that assignments are late, a 10% deduction in the overall grade for that assignment will be enforced.

Grading

Grading is a certification that the student has clearly demonstrated a level of expertise as required in each assignment or exercise.

"A" indicates that the level of expertise is superior (excellent work.)

"B" indicates the project task or problem is clearly resolved but lacks in-depth study or resolution in one or two areas.

"C" indicates the level of work is satisfactory; perhaps somewhat mediocre.

"D" indicates the level of expertise is minimal and weak. (This is a passing grade for the

University; however, a minimum grade of "C" is required to proceed to the next design level.)

"F" grade indicates a failure to respond to adequately

Plus and minus marks may be used to indicate higher and lower rating in each grade division for the purposes of averaging progress reports and final grades. A student who has shown her or his clear successful improvement throughout the semester may be given the advantage in the case of borderline final grade averages.

Grade equivalencies

A+=	**98-100**	**B+=**	**87-89**	**C+=**	**77-79**	**D=**	**65-69**
A=	**94-97**	**B=**	**84-86**	**C=**	**74-76**	**F=**	**Below 65**
A-=	**90-93**	**B-=**	**80-83**	**C-=**	**70-73**		

Grade Appeals:
Students initiating grade appeals should follow the official Grade Appeals Procedures outlined by the College.

Final Documentation:
All assignments being digital or any kind of drawings will be documented in high quality digital forms and printout in portfolio format for the end of the semester. This will be weighted with the rest of the semester's work towards the final grade.

Student work: The College of Architecture reserves the rights to retain, exhibit, and reproduce work submitted by students. Work submitted for grade is the property of the college and remains as such until it is returned to the student. For exhibition purposes keep all material available for the instructor at the end of semester.

For further information on schedules, deadlines and other requirements, see project statements, handouts, or web postings by your studio instructor.

Application for Graduate Certificate Program

1. **Name of the Graduate Certificate Program:**
   Graduate Certificate in College Student Counseling

2. **Name of Home Department and Home College:**
   Counselor Education Program in the Department of Educational Psychology and Leadership in the College of Education

3. **Graduate Advisor for Certification Program:**
   Counselor Education Faculty (Loretta Bradley, Janet Froeschle, Aretha Marbley)

4. **Required Courses & Elective Courses:**
   15 hours are required for the certificate

Required Courses: 4 Courses Required		
Required Courses	***Frequency of Offerings***	***Prerequisites***
EPCE 5364 : Theories of Counseling	Fall, Summer	None
EPCE 5354: Group Counseling	Fall, Summer,	None
EPCE 5355: Introduction to Career Counseling	Fall, Spring	None
EPCE 5357: Counseling Techniques	Fall, Spring Summer	See Handbook
Elective Courses: Select one course from the following:		
Elective Courses	***Frequency of Offerings***	***Prerequisites***
EPCE 5094: Internship in Counseling	Fall, Spring, Summer	See Handbook Consent of the program faculty
EPCE 5372: Addictions: An Overview for School and Community Counselors (Required for Counseling MEd majors.	Fall	None
Any Course in the student's degree area that is related to college student counseling	Flexible	Program Faculty Approval
EPCE 5369: Counseling Seminar (Practicum Experience in Degree Area)	Fall, Spring	None
EPCE 5372: Addictions: An Overview for School and Community Counselors	Fall	None
EPCE 5369: Crisis and Trauma Intervention Counseling (New Course)	To be Submitted for Approval	See Handbook
EPCE 5371: Counseling Diverse Populations for LPCs	Spring, Summer	5353, 5364
EPCE 5360: Practicum in Counseling Offered under seminar course title until it has been approved.	Fall, Spring	See Handbook or consent of the program faculty
EPCE 5369: Supervision in Counseling Offered under seminar course title until it has been approved.	To be Submitted for Approval.	See Handbook or consent of the program faculty

Other Requirements:

Students admitted and approved to receive the Graduate Certificate in College Student Counseling must be currently admitted in or have a master's degree in a counseling related field (e.g., counseling, psychology, family counseling, student affairs, student advising, and family studies). Students who are currently enrolled in the masters' degree program in counseling or related field will be awarded the certificate following the completion of the above requirements and upon graduating with a master's degree. Please note that this proposed certificate is not a mental health license or certification. Only students who complete a master's degree or a doctorate degree in a mental health field are eligible to apply for a mental health license.

Name of advisor(s) Loretta Bradley, Janet Froeschle, and Aretha Marbley

5. **Course Availability:**
   All required courses are currently available, but new courses related to the certificate will be developed.

   a. **Need:**
      In an era of increased accountability, helping professionals are constantly asked about their credentials. While this College Student Counseling Certificate does not represent licensure or certification in mental health, it is a certificate that will enhance professionals who work in student counseling, student mentoring, student advising, student personnel, and student affairs perform their duties more effectively. Thirty-three college and universities with Council for Accreditation of Counseling & Related Educational Programs (CACREP) accredited programs in the United States offer training, specialization, certification, or a degree in college counseling. Thus, as a CACREP accredited program, in today's academic arena of credentials, providing the college student certificate will enhance our students' marketability in fields that serve this population

6. **Number of Students per Year:**
   Based on the inquiries of professionals (and those taking our courses) in college advising, student affairs, and mentoring programs, the number of students is estimated to be 10-20.

7. **How Was the Information Determined:**
   The Student Counseling Certificate will attract students from our counseling program who are interested in college counseling, advising, and student affairs, as well as students in other helping-related professional areas who need counseling knowledge. Such fields might include higher education, educational leadership, and teacher education.

8. **Impact on Existing Degree Programs:**
   This certificate has the potential to increase the number of students in enrolled in masters-level courses and to attract both master and doctoral students.

9. **Existing Graduate Certificate Programs in EP&L:**
   a. Autism (Special Education Program)
   b. Dual Sensory Impairment (Special Education Program)
   c. Mental Health Certificate (Counselor Education)

Departmental Approval: The department chair's signature below indicates that the program has been approved by the department and that the department is willing to administer the graduate certificate program. The department chair's signature also indicates that the proposed graduate certificate program meets the academic standards for graduate certificate programs.

College Approval: The signature of the Dean or his or her representative below indicates that the proposed graduate certificate program meets the academic quality for academic programs and that it supports the strategic plan of the college.

Department Chair	**Date** 7-27-2010
Dean, College of Education	**Date** 7/27/10
Dean, Graduate School	**Date**
Provost	**Date**

GUIDELINES FOR COURSE APPROVAL REQUESTS

Office of the Provost

DRAFT 8/31/10

The following guidelines are intended to orient college and department faculty and staff about the information to be provided for new course requests and requests for a change in title, description, prerequisite, hours, etc. for existing courses. The information requested will provide the various committees that consider course approval requests with the background material they need to properly evaluate such requests. It should be noted that the purpose of review for new course and course change requests is to (1) insure that courses meet standards of rigor and intellectual content consistent with the level of instruction at which they are to be offered, (2) to insure that departments and colleges have the faculty and other resources available to manage effectively the added course load, (3) to avoid proliferation of courses, (4) to resolve any potential conflicts that might develop as a result of course or program duplication

1. All requests for new courses or changes to existing courses must be submitted using either the undergraduate or graduate Course Approval Form available on the Institutional Research and Information Management (IRIM) website at: http://www.irim.ttu.edu/CourseInventory.php. The information provided on these forms is used to add a new course to the course inventory and to develop catalog copy.
2. All new course requests must be accompanied by the Course Fee Request form that is attached to the Course Approval Form. This form must be submitted even if no course fees are requested.
3. All new course requests should also include the following information:
    a. The proposed Classification of Instructional Programs (CIP) code for the new course. CIP codes are listed on the IRIM website at: http://www.txhighereddata.org/Interactive/CIP/.
    b. A course syllabus that contains sufficient detail so that members of oversight committees will be able to determine the topics covered in the course. The syllabus should include appropriate student learning outcomes and assessments.
    c. An explanation of why the new course is being proposed, including how it fits into existing or proposed degree programs, estimated enrollment, frequency at which the course will be offered and any additional information that will help the committee evaluate the need for the new course. Refer to the program strategic plan, graduate program review, accreditation reports and similar documentation as appropriate to support course approval requests.
    d. A statement by the department or college making the request that financial and faculty resources are adequate to support the new or modified course.
    e. If the program proposing a new course offers an undergraduate course that covers similar topics, explain how the graduate course will differ: what additional topics will be considered, how will the graduate course probes more deeply into the topic, how will

the approach be different (i.e., theoretical rather than descriptive, greater emphasis on problem solving, focus on applications rather than basic information, etc.).

f. Indicate what courses, if any, the proposed course will replace and provide a schedule for their deletion from the curriculum.
g. If the course has been taught as a topics course, indicate the semesters and enrollment for the semesters taught.

4. If this course covers material similar to what is offered by other departments such as statistical methods, research techniques, ethics, leadership, or teaching methods, provide an explanation for why students cannot take the existing course to fulfill the requirement the proposed course would satisfy.
5. Any additional information that may help review committees to evaluate the need for the proposed new course.
6. For proposals to make a substantive change in an existing course such as a change in title, description, number of hours, adding non-credit labs or recitations, please provide a clear and complete explanation for why the change is necessary, including how the modification will contribute to the educational program(s) of the area proposing the change. Typically, such explanations would refer to recent developments in the field that require different approaches and/or course content, removing outdated or obsolete material, or incorporating new terminology.

Definitions:

A cross-listed course is one that is taught under two separate numbers (i.e., HIST 4327/WS4327 Gender, Race, and Class in United States Law) with the same instructor(s) in the same classroom at the same time.

A dual-listed class is taught by separate instructors and at different times (which could be in the same semester or not) in different classrooms. I.e., different courses but with enough content duplication that students should not receive credit for taking both courses (i.e., ENGR 1315, Introduction to Engineering/M E 1315, Introduction to Mechanical Engineering). One or the other may be taken for credit, not both.

A piggyback course is a pair of courses, one upper-level undergraduate (3000 or 4000) and the other graduate level (5000) that are taught by the same instructor in the same classroom, but with distinct and significantly more rigorous requirements for the graduate students than for the undergraduate students, including reading assignments, examinations, papers and other written work.

CORE CURRICULUM COMMITTEE
COURSE ACTION SUMMARY SHEET

	Current core curriculum requirement fulfilled/requested	**Core Area Committee recommendation**	**Steering Committee recommendation**	**Academic Council recommendation**
Additions				
WE 2300	Technology and Applied Science	Approve, 8/11/20	Approve 9/10/10	
Deletions				
MUAP 3205	VPA	Approve 12/17/09	Approve 9/10/10	

CORE CURRICULUM COMMITTEE
COURSE ACTION SUMMARY SHEET

Justification
New course in new program.
Department request

September 2010 Academic Council
Summary of Proposed Course Approvals

30	College	Action	Prefix & No.	Title	HRS	Fee	Description/Term/CIP/Level
1	AG	ADD	AAEC 5396	Winery Planning, Design, and Operations	3:3:0	Y	An in-depth investigation of winery design and business modeling. (PSS 5313) **Justification:** The Texas wine industry is undergoing a period of unprecedented growth. This course is one of a series of courses developed to train and educate enology and viticulture professionals to serve the state's grape and wine industry. The course will be jointly taught by an enologist and an agricultural economist. **Effective Term: Spring 2011** **CIP Code: 01.0607.0005**
2	AG	CHG hours	ANSC 3404	Consumer Selection and Utilization of Meat Products	4:3:3 to 4:3:2	N	A course for nonmajors who desire general knowledge of meat purchasing, selection, and cookery. Aspects of hazard analysis, food safety, and sanitation will be studied. Partially fulfills Core Natural Sciences requirement. F, S, SS. **Justification:** This course should have a 2-hour lab, not a 3-hour lab. It has been taught for many years as a 2-hour lab. The hours need to reflect what is being taught. **Effective Term: Spring 2011** **CIP Code: 01.0901.0005**
3	AG	CHG hours	ANSC 4403	Beef Production	4:3:3 to 4:3:2	N	Prerequisite: ANSC 3301. The breeding, feeding, and managing of beef herds for profitable production of slaughter cattle. Emphasis on commercial cow-calf herds. Field trips to ranches. S. (Writing Intensive) **Justification:** This course should have a 2-hour lab, not a 3-hour lab. It has been taught for many years as a 2-hour lab and needs to reflect what is being taught. The change will also align it with another 2-hour production course, ANSC 4402. **Effective Term: Spring 2011** **CIP Code: 01.0901.0005**
4	AG	CHG hours	ANSC 4406	Sheep and Goat Production	4:3:3 to 4:3:2	N	Prerequisite: ANSC 3301. Sheep, goat, wool, and mohair production management and marketing practices. Field trips to ranches and feedlots. S. (Writing Intensive) **Justification:** This course should have a 2-hour lab, not a 3-hour lab. It has been taught for many years as a 2-hour lab and needs to reflect what is being taught. The change will also align it with another 2-hour production course, ANSC 4402. **Effective Term: Spring 2011** **CIP Code: 01.0901.0005**
5	AG	ADD	PSS 5313	Winery Planning, Design, and Operations	3:3:0	Y	An in-depth investigation of winery design and business modeling. (AAEC 5396) **Justification:** The Texas wine industry is undergoing a period of unprecedented growth. This course is one of a series of courses developed to train and educate enology and viticulture professionals to serve the state's grape and wine industry. The course will be jointly taught by an enologist and an agricultural economist. **Effective Term: Spring 2011** **CIP Code: 01.0607.0005**
6	ARCH	ADD	ARCH 5303	Smart Materials	3:3:3	Y	Studies emerging materials and how properties and performances affect design thinking. Investigates advanced technologies facilitating design innovation in building components and their assemblies. **Justification**: This course prepares students to meet the challenges and opportunities created by the emerging field of digital design and fabrication by making them proficient in the technologies, equipment, and environmental issues addressed by this developing field and used in the profession of architecture. **Effective Term: Spring 2011** **CIP Code: 04.0201.0006**

7	ARCH	ADD	ARCH 5304	Design Process	3:3:0	Y	Explores emerging methods of computation as generative tools of the design process in which design intent captured through algorithmic processes and parametric modeling enables design alternatives. **Justification**: This course prepares students to meet the challenges and opportunities created by the emerging field of digital design and fabrication by making them proficient in the technologies, equipment, and environmental issues addressed by this developing field and used in the profession of architecture. **Effective Term: Spring 2011** **CIP Code: 04.0201.0006**
8	AS	CHG hours	ESS 3318	Exercise and Sport Psychology	3:2:2 to 3:3:0	N	Emphasis on the social and psychological factors pertaining to participation in sport and exercise. **Justification**: The material is covered in lecture and can be supplemented with online activities rather than a required lab. **Effective Term: Spring 2011** **CIP Code: 13.1314.0004**
9	AS	CHG hours	ESS 3321	First Aid	3:2:2 to 3:3:0	N	Skills and knowledge in First Aid and CPR. American Red Cross certification is possible. **Justification**: The material is covered in sequence and the skill practice is conducted afterward. The material can be covered in a class that meets 80 minutes twice a week during the fall and spring semesters. **Effective Term: Spring 2011** **CIP Code: 13.1314.0004**
10	AS	CHG number, hours, prerequisite, description	GPH 5221 to GPH 5321	Advanced Seismic Exploration Methods	2:1:3 to 3:2:3	Y	Prerequisites: MATH 1351 and GEOL 2303 or consent of instructor. Discusses methods to collect, process, and interpret seismic reflection data. (GPH 4321) **Justification**: This class was originally set up as two classes with each having 2-hours credit (GPH 5221 and 5231), The material covered in this class (applied and theoretical) was spread over two or three classes (3 hours each), but we did not have the student population to offer several seismology classes. We are now trying to simplify the listing by making the applied class match the undergraduate class and give the graduate student the appropriate level of credit. An increase in enrollment has allowed the separation of the material and the offering of the theoretical material in a separate class. **Effective Term: Spring 2011** **CIP Code: 40.0603.0002**
11	AS	CHG number, hours, title, prerequisites, description	GPH 5223 to GPH 5323	**Current**: Advanced Applied Electrical Methods **Proposed**: Advanced Non-Seismic Exploration Methods	2:1:3 to 3:2:3	Y	Prerequisites: GEOL 2303 and MATH 2350 or consent of instructor. Covers methods to explore Earth's subsurface using gravity, magnetic, electrical, and electromagnetic methods. (GPH 4323) **Justification**: This class was originally offered as four separate 2-hour classes. The demand for non-seismic methods is low, so we eliminated the gravity and magnetic class 8 years ago and merged the material in the current class called electrical methods. We are renaming the class and merging the two remaining 2-hour classes into one 3-hour class. It is cross-listed with an undergraduate class and is only offered every other year. **Effective Term: Spring 2011** **CIP Code: 40.0603.0002**
12	AS	ADD	GPH 5303	Seismic Data Analysis	3:3:0	Y	Prerequisite: Consent of instructor. Principles and methods for analyzing digital seismic date, including sampling, Fourier analysis, filtering, deconvolution, and introduction to seismic migration and tomography. **Justification**: This course has been taught under a default title (GPH 5300) for the last two years. The separate course numbers indicate distinctions in course content and will permit these distinctions to be made apparent on student transcripts. **Effective Term: Spring 2011** **CIP Code: 40.0603.0002**

13	AS	ADD	GPH 5305	Velocity Model Building	3:3:0	Y	Prerequisite: Consent of instructor. Principles and usage of major seismic velocity model building approaches, including seismic refraction, semblance, migration, and tomographic velocity model building methods. **Justification**: This course has been taught under a default title (GPH 5300) for the last two years. The separate course numbers indicate distinctions in course content and will permit these distinctions to be made apparent on student transcripts **Effective Term: Spring 2011** **CIP Code: 40.0603.0002**
14	AS	ADD	GPH 5307	Seismic Migration	3:3:0	Y	Prerequisite: GPH 5303 and consent of instructor**.** Theory and practicality of Kirchhoff, f-k, FD, and reverse-time migrations for subsurface imaging. **Justification**: This course has been taught under a default title (GPH 5300) for the last two years. The separate course numbers indicate distinctions in course content and permit these distinctions to be made apparent on student transcripts **Effective Term: Spring 2011** **CIP Code: 40.0603.0002**
15	AS	ADD	PHIL 4125	Introduction to Research Ethics	1:1:0	Y	Introduction to research ethics for future researchers. Frameworks of moral reasoning and their application to moral problems through a discussion of case studies. **Justification**: Some granting agencies are beginning to require ethics training for their grantees and those employed by them. This course will satisfy that requirement for undergraduate research assistants and other undergraduates employed under research grants. **Effective Term: Spring 2011** **CIP Code: 38.0103.0001**
16	AS	ADD	POLS 5395	Practicum in Survey Research	3:0:6	Y	Prerequisite: POLS 5381, 5382, 5383, and consent of instructor. Introduces students to the operation and management of a survey research lab. **Justification**: The department manages the Earle Survey Research Lab, which is primarily responsible for administering both Web and phone surveys for non-profit clients nationally. Access to the lab would allow students to learn how survey labs operate and how survey research projects are managed from question development to budgeting and training. This type of practicum will improve the job prospects of students since it will give them hands-on experience. **Effective Term: Fall 2011** **CIP Code: 45.1001.0001**
17	AS	ADD	PUAD 5310	Capstone: Practicum in Public Administration	3:3:0	Y	Prerequisite: To be taken during final semester unless an exception is granted. Applied research paper requiring students to use concepts from their M.P.A. courses to analyze, synthesize, and formulate recommendations that address a real-world public administration problem or policy issue. Requires oral presentation. (Graded on pass/fail basis) **Justification**: We propose to replace the last 3 hours of the 6-hour internship course with this capstone course required of all students. The class is a combination of classroom instruction and independent research under the guidance of an instructor. The product of the course will be the research and writing on a practical, applied administrative problem or policy integrating concepts from previous courses. This course will be taken in the final semester. The research will also be orally presented. This course is designed as pass/fail. **Effective Term: Spring 2011** **CIP Code: 44.0401.0001**

18	AS	ADD	SPAN 5301	Writing for the Profession	3:3:0	Y	Prepares students to conduct independent research in the fields of Hispanic literature, linguistics, and cultures and to write effectively. **Justification**: Students entering graduate programs in Spanish need guidance in locating and utilizing research tools for conducting investigations in the fields of Hispanic literature, linguistics, and cultures. They also need instruction in formulating innovative theses for investigations. This course will guide students in writing professionally and convincingly, which are skills needed to make presentations at professional conferences, publish research in peer-reviewed journals, and write effective grant proposals. **Effective Term: Spring 2011** **CIP Code: 16.0905.0001**
19	ED	ADD	EDBL 3335	Teaching Linguistically and Culturally Diverse Students in EC-6 Mainstream Classrooms	3:3:0	Y	Skills, attitudes, cultural, and psycholinguistic knowledge relevant for second language acquisition and development in relation to teaching practices for linguistically and culturally diverse students. **Justification**: To better comply with national accreditation requirements and Texas Teaching Competencies, this course replaces EDBL 3334 for teacher candidates not seeking bilingual or ESL certification. EDBL 3334 does not provide mainstream teachers with the practical skills needed to teach linguistically diverse students effectively. This course will provide the pedagogical knowledge and skills that mainstream teachers need to meet the instructional needs of linguistically diverse students. **Effective Term: Spring 2011** **CIP Code: 13.0201.0004**
20	ENGR	ADD	ECE 5363	Pattern Recognition	3:3:0	Y	Foundational topics in pattern recognition. Linear discriminant functions, support vector machines, generalized decision functions, Bayes classifier, and various clustering techniques (ECE 4363) **Justification**: This course is important to broaden elective offerings in the curriculum and to provide foundational knowledge in the field of pattern recognition. By making this course a prerequisite for ECE 6363, we will provide a progressive course sequence of pattern recognition to prepare qualified researchers in this field. The department has been offering this course annually for several years as a special topics course. It will be cross-listed with ECE 4363, an undergraduate elective scheduled annually. The Department of Computer Science lists a similar course, CS 5341. The CS course has been taught only once from Spring 2006 through Spring 2010. **Effective Term: Spring 2011** **CIP Code: 14.0901.0006**
21	ENGR	CHG title, description	ECE 6363	**Current**: Adaptive Pattern Recognition **Proposed**: Advanced Pattern Recognition	3:3:0	Y	Prerequisite: ECE 4363 or 5363. Adaptive approaches to the design of discriminate functions for pattern classification and recognition. Statistical, syntactic, neural networks, and fuzzy-set based optimization constraints for discriminants. **Justification**: The title and prerequisite changes reflect the restructuring of this course to build upon ECE 5363. Departmental faculty research is heavily involved in the pattern recognition research track. **Effective Term: Spring 2011** **CIP Code: 14.0901.0006**

22	ENGR	ADD	ENVE 5314	Membrane Treatment Processes	3:3:0	Y	Prerequisite: CE 3309 or consent of instructor. Introduces the fundamental principles and applications of various membrane processes (MF, UF, NF and RO) in water and wastewater treatment and quality control. (ENVE 4314) **Justification**: Membrane technology in water and wastewater treatment is an advanced topic that is not well covered in the conventional environmental engineering courses. In the last two decades membranes have been increasingly used in various water and wastewater treatment processes because their effluent quality is better than conventional treatment methods. The knowledge of membrane processes in water and wastewater treatment will increase the marketability of the department's graduates. **Effective Term: Spring 2011** **CIP Code: 14.0801.0006**
23	ENGR	ADD	ENVE 5315	Environmental Chemistry for Pollution Management	3:3:0	Y	Prerequisite: CE 3309 (or equivalent) or consent of instructor. Introduces the fundamental knowledge of reaction kinetics and chemical equilibriums relevant to water quality in natural and engineered processes. (ENVE 4315) **Justification**: Water chemistry is an important part of the training of environmental engineers. The quality of natural water and water treatment processes is largely controlled by the kinetics and equilibriums of chemical reactions in water solution. This course will help students understand the principles of water quality control and enhancement so they can design more efficient water and wastewater treatment processes. The course will be taught on a three-semester rotation. **Effective Term: Spring 2011** **CIP Code: 14.0801.0006**
24	ENGR	ADD	ME 5339	Transmission Electron Microscopy	3:2:3	Y	Prerequisite: ME 2311. Introductory course in theory and practical use of the transmission electron microscope (TEM) as a research tool. Provides background information for designing research protocols and using instrumentation for recording and analyzing images. **Justification**: Students in mechanical engineering and other engineering disciplines need to know how to characterize engineering materials using the transmission electron microscope at the atomic level. This course will enable students to more effectively pursue their M.S. and doctoral research. **Effective Term: Spring 2011** **CIP Code: 14.0901.0006**
25	ENGR	ADD	ME 5343	Contact Mechanics of Engineering Materials	3:3:0	Y	Prerequisite: Departmental approval. Knowledge of material science, engineering mechanics, and MATLAB programming. Introduction and advanced knowledge of surface interactive forces and interface contact mechanics of engineering materials. **Justification**: This class is important to the mechanical engineering program because mechanical engineers experience material contact problems in the real world, but the current mechanics-related classes do not include the systematic and in-depth knowledge of contact mechanics. **Effective Term: Spring 2011** **CIP Code: 14.0901.0006**
26	ENGR	DEL	ME 5348	Phase Transformation II	3:3:0	N	Prerequisite: ME 5341 and 5347. Strain-induced phase transformations, transformation-induced plasticity. Continuum thermodynamics and kinetics of interaction between phase transformation and plasticity. **Justification**: There is currently no faculty to teach this course. The content is covered in the new course ME 5343. **Effective Term: Spring 2011** **CIP Code: 14.0901.0006**

27	ENGR	ADD	ME 5356	Digital Human Modeling for Human-Centric Design	3:3:0	Y	Prerequisite: Departmental approval. Knowledge of kinematics and dynamics, vector and matrix algebra, C programming. Introduction to human anatomy, skeletal model, anthropometry, human modeling packages, kinematics of human multibody system, posture prediction and dynamics motion prediction. **Justification**: This class is part of the bioengineering program and is important to the program because the current design course does not include a human component in the design process. This course will lead students to understand how to model humans and evaluate design in the early design stage to save time and money. **Effective Term: Spring 2011** **CIP Code: 14.0901.0006**
28	HON	CHG number	HONS 2302 to HONS 3305	European Fine Arts	3:0:0	N	Prerequisite: Enrollment in the Honors College or approval of the Honors dean. Hands-on survey of European fine arts, including visual arts, architecture, music, theatre, and dance. Fulfills Core Visual and Performing Arts requirement. **Justification:** Content is upper-division in magnitude. **Effective Term: Spring 2011** **CIP Code: 30.0101.0002**
29	HUM	CHG number, hours, title, description	PFP 5198 to PFP 5389	**Current**: Professional Practices in Personal Financial Planning **Proposed**: Professional Development in Personal Financial Planning	1:1:0 to 3:3:0	N	Prerequisite: Completion or concurrent enrollment in PFP 5371 with a grade of C or higher. Preparation for internship experience. Advanced topics in business models, back office and staffing. Includes 30 hours of volunteer work with VITA to give students client experience before internships. Enrollment precedes PFP 5399. (PFP 3398) **NOTE:** Request to piggyback with PFP 3398. **Justification:** Increasing hours due to amount of course content. **Effective Term: Spring 2011** **CIP Code: 52.0804.0016**
30	HUM	CHG number, prerequisite	PFP 5378 to PFP 6377	Research Methods I	3:3:0	N	Prerequisites: PFP 6305 and 6374. Introduces doctoral students to the scientific research process. Various elements of the research process will be identified and analyzed and students will have an opportunity to work with data and statistical software to engage in the research process. **Justification:** New course number reflects the doctoral level of the course. **Effective Term: Spring 2011** **CIP Code: 52.0804.0016**
31	HIM	CHG title, prerequisite	PFP 6330	**Current**: Research Fund Development **Proposed**: Seminar in Research and Philanthropic Fund Development	3:3:0	N	Prerequisite: PFP 6377. Exploration of processes for preparing research ideas for presentation to individuals, groups, and/or organizations. Study of research proposal characteristics, how proposals are reviewed, strategies for success, and public versus private funding sources. **Justification:** New title is more descriptive of course content and purpose. **Effective Term: Spring 2011** **CIP Code: 52.0804.0016**