New Course Requests

A655 AERO 606 Multifunctional Materials (2-1) Credit 3. This course will present an in-depth analysis of multifunctional materials and composites, and their novel applications. Prerequisite(s): Theory of elasticity or Continuum Mechanics MEMA 601 or MEMA 602/AERO 603, MSEN 601 or MEMA 609. Cross-listed with AERO 606/MSEN 606/MEMA 606.

A658 AERO 608 Nanomechanics (3-0) Credit 3. Application of mechanics concepts to nano-scale behavior of materials. Review of continuum mechanics; Extensions to generalized continua; Nonlocal elasticity; Nano-scale plasticity. Focus on multi-scale modeling: Dislocation Dynamics; Quasi-Continuum method; Molecular dynamics with introductions to quantum mechanics and statistical mechanics. Prerequisite(s) AERO 603 or MEMA 601. Cross-listed with AERO/MEMA/MSEN 608.

A650 BUAD 698 Writing for Publication (3-0) Credit 3. Writing in academic disciplines and settings. Writing for different audiences and purposes. Style; planning and development of journal articles; grant proposals; correspondence; oral presentations; technical reports. Permission of departmental/college graduate advisor. Prerequisite(s): advanced standing in master’s/doctoral program.

A652 CARC 698 Writing for Publication (3-0) Credit 3. Writing in academic disciplines and settings. Writing for different audiences and purposes. Style; planning and development of academic journal articles; grant proposals; correspondence; oral presentations; technical reports. Permission of departmental/college graduate advisor. Prerequisite(s): advanced standing in master’s doctoral programs.

A660 ECEN 697 Fluctuations & Noise Electronics (3-0) Credit 3. This course is introducing the students to the research of Noise and Fluctuations. Noise and Fluctuations in electronics and other systems include virtually all scientific fields, including secure and non-secure communications, microprocessors, quantum information, mesoscopic systems, chemical sensing, corrosion diagnostics, neuro- and membrane-biology, biomedicine, etc. Prerequisite(s) Approval of Instructor.

A653 EDCI 603 Professional Development: Strategies for Teachers (3-0) Credit 3. Principles of organizational management, instructional design, and change theory in framing professional development programs. Prerequisite(s): Graduate classification.
A661 ENGR 698 Writing for Publication (3-0) Credit 3. Writing in academic disciplines and settings. Writing for different audiences and purposes. Style; planning and development of academic journal articles; grant proposals; correspondence; oral presentations; technical reports. Permission of departmental/college graduate advisor. Prerequisite(s): advanced standing in master's/doctoral programs.

A656 MEMA 606 Multifunctional Materials (2-1) Credit 3. This course will present an in-depth analysis of multifunctional materials and composites, and their novel applications. Prerequisite(s): Theory of elasticity or Continuum Mechanics MEMA 601 or MEMA 602/AERO 603, MSEN 601 or MEMA 609. Cross-listed with AERO 606/MSEN 606/MEMA 606.

A659 MEMA 608 Nanomechanics (3-0) Credit 3. Application of mechanics concepts to nano-scale behavior of materials. Review of continuum mechanics; Extensions to generalized continua; Nonlocal elasticity; Nano-scale plasticity. Focus on multi-scale modeling: Dislocation Dynamics; Quasi-Continuum method; Molecular dynamics with introductions to quantum mechanics and statistical mechanics. Prerequisite(s): AERO 603 or MEMA 601. Cross-listed with AERO/MEMA/MSEN 608.

A657 MSEN 606 Multifunctional Materials (2-1) Credit 3. This course will present an in-depth analysis of multifunctional materials and composites, and their novel applications. Prerequisite(s): Theory of elasticity or Continuum Mechanics MEMA 601 or MEMA 602/AERO 603, MSEN 601 or MEMA 609. Cross-listed with AERO 606/MSEN 606/MEMA 606.

A654 MSEN 608 Nanomechanics (3-0) Credit 3. Application of mechanics concepts to nano-scale behavior of materials. Review of continuum mechanics; Extensions to generalized continua; Nonlocal elasticity; Nano-scale plasticity. Focus on multi-scale modeling: Dislocation Dynamics; Quasi-Continuum method; Molecular dynamics with introductions to quantum mechanics and statistical mechanics. Prerequisite(s) AERO 603 or MEMA 601. Cross-listed with AERO/MEMA/MSEN 608.

A651 RDNG 620 Literacy and Language (3-0) Credit 3. Orthography of different languages and its relation to literacy acquisition and failure to acquire basic literacy skills. This is a seminar course in reading, language arts, bilingual education, psychology, linguistics, and related fields. Prerequisite(s): Graduate status.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of Aerospace Engineering.
   
2. Course prefix, number and complete title: AERO 606/MEMA 606/MSEN 606 Multifunctional Materials
   
3. Course description (not more than 50 words): This course will present an in-depth analysis of multifunctional materials and composites, and their novel applications.
   
4. Prerequisites: Theory of elasticity or Continuum Mechanics
   
5. Cross-listed with: AERO 606/ MEMA 606/MSEN 606
   
6. Prerequisite(s): MEMA 601 or MEMA 602 / AERO 603, MSEN 601 or MEMA 609
   
7. Is this a variable credit course?  □ Yes  □ No  If yes, from ______ to ______.
   
8. Is this a repeatable course?  □ Yes  □ No  If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term?  □ Yes  □ No
   
9. Has this course been taught as a 489/689?  □ Yes  □ No  If yes, how many times?  ______
    Indicate the number of students enrolled for each academic period it was taught. 05C-10(MEMA/AERO/MSEN)

10. This course will be:
    a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
    b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

M.S., Ph.D. in Aerospace, Mechanical, Materials Science Engineering

If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

Prefix  Course #  Title (exclude punctuation)
AERO 606  MULTIFUNCTIONAL MATERIALS

<table>
<thead>
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<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
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<th>Admin. Unit</th>
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Approval recommended by:

Head of Department  Date
Head of Department (if cross-listed course)  Date

Submitted to Coordinating Board by:

Director of Academic Support Services  Date

Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OAR/AS-5/04

3 of 82 C
AERO 606: Multifunctional Materials
Crosslisted as MEMA 606 / MSEN 606

Course Description
- Semester course, 2 lecture hours, 1 lab hour, 3 credits

The course will present an in-depth analysis of multifunctional materials and composites, and their novel applications. Multifunctionality is a term generally used to describe the ability of certain materials to integrate structural utility with other non-structural functionality, such as sensing/actuation or self-healing. Biological materials are inherently multifunctional in that they have a hierarchical structural organization and a coupling between structure and function that combines a range of capabilities, to save weight and volume (e.g., wood and bone). They are the inspiration for emerging synthetic multifunctional materials and systems.

Topics covered will include processing, characterization and constitutive modeling of multifunctional materials. Materials such as electroactive polymers; piezoelectric, magnetostrictive, and shape memory materials and nanostructured polymer composites will be considered. The constitutive behavior of multifunctional materials will be covered both from a theoretical and an experimental perspective. Applications to actuators, nanostructured composites and smart structures will be discussed. Other materials and applications will be introduced through course projects.

Course Objectives
The overall course objective is to provide students with a comprehensive look into the state of the art in multifunctional materials and structures.

- Introduce multifunctionality as exhibited by synthetic materials and biological material systems.
- Demonstrate how resulting properties in multifunctional materials are related to molecular and atomic level mechanisms that translate into useful macroscopic properties.
- Establish principles for deriving multifunctional constitutive response, emphasizing scale transitions.
- Use characterization tools for multifunctionality.

Course Content
1. Introduction to multifunctional materials and their applications:
   a. Biological materials exhibiting multifunctionality (e.g. bone, marine organisms, etc.)
   b. Bioinspired synthetic materials
   c. Aerospace, medical and MEMS applications
2. Coupled fields in multifunctional materials; constitutive relations.
   a. Microscale mechanisms
   b. Constitutive models for macroscale representation of response
3. Classes of multifunctional materials
   a. Electroactive polymers and composites.
   b. Nanostructured and nanoreinforced polymers
   c. Carbon nanotube and carbon nanotube-based composites
   d. Magnetoactive materials.
   e. Shape and magnetic shape memory alloys.
a. Lab familiarity with applicable characterization such as microscopy, mechanical, magnetic and electrical characterization.
b. Mechanical, thermal, electrical and magnetic response
c. Sensing and actuation performance
5. Multifunctionality at different length scales – from nano to macro.
a. Difference between bulk and nanoscale properties will be presented
b. Coupling between nanoscale properties and macroscale performance
6. Applications in design of multifunctional structures.

Course Outline with Approximate Times Assigned to Each

1. Multifunctional materials and their applications. 6
2. Coupled fields; constitutive relations. 6
3. Classes of multifunctional materials. 6
4. Characterization of multifunctional materials. 6
5. Multifunctionality at different length scales. 6
6. Applications in design of multifunctional structures. 3
7. Project/lab 10
8. Midterm. 2

Total 45

Course Materials
Course materials consist of lecture notes and articles from the current literature.

Prerequisites / Co-requisites
Theory of Elasticity (MEMA 601) or Continuum Mechanics (MEMA 602 / AERO 603)
MSEN 601 or MEMA 609

Grading
Homework, labs, quizzes 35%; Midterm 30%; Project 35%.

Instructors
Dr. Zoubeida Ounaies, Department of Aerospace Engineering
HRBB 744C; phone: 458-1330; e-mail: zounaies@aero.tamu.edu

Americans with Disabilities Act
The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 8118 Cain Hall, or call 845-1637.

Copyrights
The handouts used in this course are copyrighted. By "handouts" we mean all materials generated for this class, which include but are not limited to syllabi, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless the author expressly grants permission.

Scholastic Integrity
As commonly defined, plagiarism consists of passing off as one's own the ideas, work, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules [http://student-rules.tamu.edu/], under the section "Scholastic Dishonesty."
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 25 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of Aerospace Engineering

2. Course prefix, number and complete title [AERO 608] MEMA 608 / MSEN 608 - Nanomechanics

3. Course description (not more than 50 words) Application of mechanics concepts to nano-scale behavior of materials. Review of continuum mechanics; Extensions to generalized continua; Nonlocal elasticity; Nano-scale plasticity. Focus on multi-scale modeling: Dislocation Dynamics; Quasi-Continuum method; Molecular dynamics with introductions to quantum mechanics and statistical mechanics.

4. Prerequisite(s) [AERO 603] and/or MEMA 602. Cross-listed with AERO/MEMA/MSEN 608

5. Is this a variable credit course? ☐ Yes ☑ No If yes, from ______ to ______.

6. Is this a repeatable course? ☐ Yes ☑ No If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? ☐ Yes ☑ No

7. Has this course been taught as a 489/689? ☐ Yes ☑ No If yes, how many times? 2 Indicate the number of students enrolled for each academic period it was taught. 7 in Fall 2004, 8 in Fall 2006

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   M.S. and Ph.D. programs in Aerospace Engineering, Mechanical Engineering, Materials Science Engineering

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix | Course # | Title (exclude punctuation) | Lect. | Lab | SCH | Subject Matter Content Code | Admin. Unit | Acad. Year | FICE Code | Level

| AERO 608 | NANOMECHANICS | 0 | 3 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 7 | 0 | 8 | 0 | 1 | 0 | 3 | 6 | 0 |

Approval recommended by:

Head of Department: [Signature] Date: [Date]

Chair, College Review Committee: [Signature] Date: [Date]

Dean of College: [Signature] Date: [Date]

Submitted to Coordinating Board by:

Director of Academic Support Services: [Signature] Date: [Date]

Effective Date: [Date]

* Attach a syllabus according to the guidelines on the Internet site www.tamu.edu/admissions/oaras. To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

GAR/AS-10/99

6 of 82 C
AERO/MEMA/MSEN 608 Nanomechanics
Credit 3: (3-0)

Instructor: A.A. Benzerga  Office: 736C H.R. Bright Building  Tel: 845-1602
Office Hours: Monday and Wednesday from 5 to 6 pm  E-mail: benzerga@aero.tamu.edu

Course Description: This two-part course adopts a top-down approach to nanomechanics. The first part (continuum nanomechanics) is based on advanced elasticity and diffusion concepts to motivate topics such as nanoindentation and self-assembly. The second part (discrete methods in nanomechanics) is focused on multi-scale computational methods. The course integrates concepts from continuum mechanics, solid state physics and atomistics.

Prerequisites: AERO 603 or MEMA 601

Course Text: There is no required text for this class. Notes and copies will be occasionally handed-out to motivate certain topics.

Course Evaluation:
Homeworks and quizzes  35%
Project            30%
Paper Review      15%
Final Exam        20%

Course Topics

1. Continuum Nanomechanics (Total 22)
   (a) Elasticity and diffusion equations  3
   (b) Basic results from elasticity (point forces, crystal defects)  3
   (d) Theories of patterning and self-organization  3
   (e) Theory of nanoindentation
   (f) Nonlocal elasticity: connections to physics
   (g) Nanomechanics of defects in nanorods and nanotubes  4
   (h) Microstructure evolution *

2. Discrete Methods in Nanomechanics (Total 20)
   (a) Discrete dislocation plasticity**  8
   (b) Elements of quantum mechanics  3
   (c) Introduction to molecular dynamics simulations  6
   (d) Coupled atomistic/continuum methods  3

* includes 30-50% of laboratory instruction and constitutes basic material for some projects.
** includes one session at the Immersive Visualization Center (IVC; http://ivc.tamu.edu) and constitutes basic material for some projects.
Americans with Disabilities Act
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 118 Cain Hall, or call 845-1637.

Scholastic Integrity
"An Aggie does not lie, cheat, or steal or tolerate those who do."
As commonly defined, plagiarism consists of passing off as one's own the ideas, work, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules [http://student-rules.tamu.edu/], under the section "Scholastic Dishonesty.

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Texas A&M University
Departmental Request for a New Course
Undergraduate + Graduate + Professional
Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of ________________

2. Course prefix, number and complete title ________________

3. Course description (not more than 50 words) ________________

4. Prerequisite(s) ________________ Cross-listed with ________________

5. Is this a variable credit course? □ Yes ☑ No If yes, from ______ to ______

6. Is this a repeatable course? □ Yes ☑ No If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? □ Yes ☑ No

7. Has this course been taught as a 489/689? □ Yes ☑ No If yes, how many times? ______ times Indicate the number of students enrolled for each academic period it was taught. ______

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
      any master's or doctoral program

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation) ________________
    ________________ ________________

    Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
    0 3 0 0 0 3 2 3 1 1 0 1 0 0 0 1 0 4 9 0 0 0 6 - 0 7 0 0 3 6 3 2

    Do not complete shaded area.

Approval recommended by:

Head of Department Date

Chair, College Review Committee Date

Dean of College Date

Submitted to Coordinating Board by:

Director of Academic Support Services Date

Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
OAR/AS-504
BUAD 698: Writing for Publication

Instructor:
Elizabeth Tebeaux
Professor of English
243E Blocker
Phone: 862-3593
Email: e-tebeaux@tamu.edu
Office hours: TBA

Resource website: http://www.tamu.edu/ode/graduatewritingproject
Reading assignments are located on this URL and in the required texts.

Enrollment Prerequisites

The course targets graduate students working on their theses or dissertations and/or students actively planning and writing an article for publication. Students beginning their graduate work should not enroll because of the level of writing projects required. Students who enroll should be focusing on completing their academic work and committed to improving their writing. This course is NOT about grades but having focused time to learn how to improve your writing.

Course Objectives

- Practice elements of communication needed by graduate students in an academic work context.
- Apply principles of design as these apply to sentences, paragraphs, and complete documents.
- Practice developing types of academic writing.
- Review principles of usage and punctuation—essentials of Standard English.
- Develop expertise in writing needed beyond school. Students who enroll are encouraged to focus on an article they may wish to publish or their thesis or dissertation.

Outcomes

- Students will prepare a variety of documents related to their graduate work and writing in the workplace.
- These documents will allow students to practice application of development principles needed for each kind of document.
- Students will improve their command and application of principles of writing as determined by pre-/post-assessment.

Course Description

3 SCH credit. Class sessions will have discussion, lecture, and practice time for students to work on writing projects. Course will focus on principles for developing sentences, paragraphs, scientific papers and presentations. Other topics: understanding the elements of clarity, developing grant proposals, avoiding plagiarism, understanding the perspectives of journal editors, developing effective oral presentations and PowerPoint slides, developing the CV. Students will work in teams to discuss/evaluate some assignments. Students will complete a writing assessment assignment at the beginning and the end of the course to determine improvement. Design of subsequent sections of this course will use assessment results. Course topics/assignments may vary depending on needs of the individual class.
689: Writing for Publication—2

Course Assignments — will vary with needs of each class

Writing assessment assignment—beginning and end of the term

Analysis of journal publication requirements—memorandum

Effective paragraph development
  ▪ Short paragraph abstracts based on short articles
  ▪ Revisions of two of your paragraphs.

Introduction— for an article or your thesis/dissertation
Abstracts—descriptive and informative of an article
Developing effective correspondence
  ▪ Query letter to an editor of a journal
  ▪ Proposal letter (for an article or a presentation)
Two articles:
  ▪ Article for publication; or short article summarizing your research findings
  ▪ Revision of this article for a general audience.

Effective conference presentations

Review of grammar and usage as needed; in-class practice; avoiding plagiarism

Course Requirements

  • Attend class regularly. Complete all assigned readings. Participate in team assignments. Ask questions.
    Do all assignments. All assignments must be submitted to pass the course.

Evaluation

  • Each assignment will be evaluated according to the development principles for each document assigned.
  • Evaluations will use rubric to evaluate how well students understand principles of planning, writing, revising, and editing. Grading for the course will be pass/fail.

Academic Integrity

  Aggies do not lie, cheat, or steal or tolerate those who do.

Each student is expected to do his/her own work. This course is NOT about grades but about learning how to plan, write, and revise documents important in an academic environment. Any violation of the honor code will be reported to the Honor Code Office and to the Office of Graduate Studies.

Required Books (Available at the university book store under Graduate Writing Project)
These books should be useful to you long after you have completed this course.


Wanda Van Goor and Diana Hacker, Developmental Exercises to Accompany Rules for Writers. 5th edition.
Course and Assignment Sequence

- Knowing what your field expects/requires in terms of style and presentation.
- Writing an effective thesis/dissertation: Barbara McGuirk, Thesis Clerk
- Effective paragraphing, clear sentence structure, document design, and concepts of organization
- Documentation: How to avoid plagiarism. Speaker: Candace Shafer, University Writing Center
- Presentation by two journal editors—Writing requirements for article acceptance
- Effective writing and proposal acceptance—Dr. Phyllis McBride. Office of Proposal Development, VPR

✓ Assignment 1: Summarize your discipline’s guide to publication. Focus on writing and style requirements for articles. Or, assess a journal in which you would like to publish. Describe kinds of articles published, focus of articles, targeted readers, length, format, sentence style, documentation, visuals, abstract type used. Prepare a memo reporting your findings. Attach several pages of an article from this journal.

- Analyzing Audiences: What do academic editors of journals expect in articles submitted for publication? Speakers: two editors from professional/academic journals currently housed at TAMU.
- Principles of Design for technical reports, articles, proposals, and correspondence
- Analyzing Paragraph Development

✓ Assignment 2: Submit two paragraphs you have written along with revisions of these paragraphs based on the elements of good paragraphs.

- Developing Abstracts: Discussion of different types of abstracts—form and content

✓ Assignment 3: Write a one-paragraph informative abstract of the article on the website (assignment readings). Write a short descriptive abstract of the same article.

- Developing Introductions: Analyze introductions of articles in journals in which you would like to publish. Analyze introductions to theses and dissertations.

✓ Assignment 4: Prepare an introduction to an article. Or, work on the introduction to your thesis/dissertation.
Review of Sentence Structure: How to write a clear, concise sentence. Sentence analysis will be studied regularly.

Short essay to study and edit. Goal: improve readability and clarity. In-class project.

Review of punctuation, usage, and grammar—will occur regularly, as needed. Focus: problems that occur in students' papers.

Designing Effective Memoranda and Letters

✓ Assignment 5: Memoranda/letters written in response to case situations. Write a letter of inquiry to a journal editor.

Designing Proposals—Dr. Phyllis McBride, Office of Proposal Development, VPR

✓ Assignment 6: Prepare a proposal for an article or a conference presentation. Scenario: A colleague in your discipline is planning a special issue on a topic. Graduate students are invited to submit one/two-page proposals for articles/presentations. Write the proposal and attach it to a letter to the person who is soliciting proposals for the special issue/conference.

Planning/writing the academic article and the popular article

✓ Assignments 7A: Write an article about a topic in your field of research. Article 7B: Target audience: general readers. Goal: Learn to explain your research to non-technical readers.

How to read an article at a conference; effective use of PowerPoint.

Developing the effective CV and application letter.

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of [Architecture]

2. Course prefix, number and complete title: CARC 698: Writing for Publication

3. Course description (not more than 50 words): Writing in academic disciplines and settings. Writing for different audiences and purposes. Style; planning and development of academic journal articles; grant proposals; correspondence; oral presentations; technical reports. Permission of departmental/college graduate advisor.

4. Prerequisite(s): Advanced standing in master's or doctoral programs

5. Is this a variable credit course? [ ] Yes [ ] No If yes, from ______ to ______

6. Is this a repeatable course? [ ] Yes [ ] No If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? [ ] Yes [ ] No

7. Has this course been taught as a 489/689? [ ] Yes [ ] No If yes, how many times? ______ times Indicate the number of students enrolled for each academic period it was taught. 25

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix: CARC | Course #: 698 | Title: Writing for Publication

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Do not complete shaded area.

Approval recommended by:

Head of Department [Signature] [Date] Chair, College Review Committee [Signature] [Date]

Head of Department (if cross-listed course) [Signature] [Date] Dean of College [Signature] [Date]

Submitted to Coordinating Board by:

Director of Academic Support Services [Signature] [Date] Effective Date [Date]

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OARAS-5/04

14 of 82 C
CARC 698: Writing for Publication

Instructor:

Elizabeth Tebeaux  
Professor of English  
243E Blocker

Phone: 862-3593  
Email: e-tebeaux@tamu.edu  
Office hours: TBA

Resource website: http://www.tamu.edu/ode/graduatewritingproject  
Reading assignments are located on this URL and in the required texts.

Enrollment Prerequisites

The course targets graduate students working on their theses or dissertations and/or students actively planning and writing an article for publication. Students beginning their graduate work should not enroll because of the level of writing projects required. Students who enroll should be focusing on completing their academic work and committed to improving their writing. This course is NOT about grades but having focused time to learn how to improve your writing.

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- Apply principles of design as these apply to sentences, paragraphs, and complete documents.
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- Review principles of usage and punctuation—essentials of Standard English.
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- These documents will allow students to practice application of development principles needed for each kind of document.
- Students will improve their command and application of principles of writing as determined by pre-/post-assessment.

Course Description

3 SCH credit. Class sessions will have discussion, lecture, and practice time for students to work on writing projects. Course will focus on principles for developing sentences, paragraphs, scientific papers and presentations. Other topics: understanding the elements of clarity, developing grant proposals, avoiding plagiarism, understanding the perspectives of journal editors, developing effective oral presentations and PowerPoint slides, developing the CV. Students will work in teams to discuss/evaluate some assignments. Students will complete a writing assessment assignment at the beginning and the end of the course to determine improvement. Design of subsequent sections of this course will use assessment results. Course topics/assignments may vary depending on needs of the individual class.
Course Assignments – will vary with needs of each class

Writing assessment assignment—beginning and end of the term

Analysis of journal publication requirements—memorandum

Effective paragraph development
  ▪ Short paragraph abstracts based on short articles
  ▪ Revisions of two of your paragraphs.

Introduction— for an article or your thesis/dissertation
Abstracts—descriptive and informative of an article
Developing effective correspondence
  ▪ Query letter to an editor of a journal
  ▪ Proposal letter (for an article or a presentation)

Two articles:
  ▪ Article for publication; or short article summarizing your research findings
  ▪ Revision of this article for a general audience.

Effective conference presentations

Review of grammar and usage as needed; in-class practice; avoiding plagiarism

Course Requirements

• Attend class regularly. Complete all assigned readings. Participate in team assignments. Ask questions. Do all assignments. All assignments must be submitted to pass the course.

Evaluation

• Each assignment will be evaluated according to the development principles for each document assigned.
• Evaluations will use rubric to evaluate how well students understand principles of planning, writing, revising, and editing. Grading for the course will be pass/fail.

Academic Integrity

Aggies do not lie, cheat, or steal or tolerate those who do.

Each student is expected to do his/her own work. This course is NOT about grades but about learning how to plan, write, and revise documents important in an academic environment. Any violation of the honor code will be reported to the Honor Code Office and to the Office of Graduate Studies.

Required Books (Available at the university book store under Graduate Writing Project)
These books should be useful to you long after you have completed this course.


Course and Assignment Sequence

- Knowing what your field expects/requires in terms of style and presentation.
- Writing an effective thesis/dissertation: Barbara McGuirk, Thesis Clerk
- Effective paragraphing, clear sentence structure, document design, and concepts of organization
- Documentation: How to avoid plagiarism. Speaker: Candace Shafer, University Writing Center
- Presentation by two journal editors—Writing requirements for article acceptance
- Effective writing and proposal acceptance—Dr. Phyllis McBride. Office of Proposal Development, VPR

✓ Assignment 1: Summarize your discipline’s guide to publication. Focus on writing and style requirements for articles. Or, assess a journal in which you would like to publish. Describe kinds of articles published, focus of articles, targeted readers, length, format, sentence style, documentation, visuals, abstract type used. Prepare a memo reporting your findings. Attach several pages of an article from this journal.

✓ Analyzing Audiences: What do academic editors of journals expect in articles submitted for publication? Speakers: two editors from professional/academic journals currently housed at TAMU.

✓ Principles of Design for technical reports, articles, proposals, and correspondence

✓ Analyzing Paragraph Development

✓ Assignment 2: Submit two paragraphs you have written along with revisions of these paragraphs based on the elements of good paragraphs.

✓ Developing Abstracts: Discussion of different types of abstracts—form and content

✓ Assignment 3: Write a one-paragraph informative abstract of the article on the website (assignment readings). Write a short descriptive abstract of the same article.

✓ Developing Introductions: Analyze introductions of articles in journals in which you would like to publish. Analyze introductions to theses and dissertations.

✓ Assignment 4: Prepare an introduction to an article. Or, work on the introduction to your thesis/dissertation.
Review of Sentence Structure: How to write a clear, concise sentence. Sentence/paragraph construction will be studied regularly.

Short essay to study and edit. Goal: improve readability and clarity. In-class project.

Review of punctuation, usage, and grammar—will occur regularly, as needed. Focus: problems that occur in students' papers.

Designing Effective Memoranda and Letters

✓ Assignment 5: Memoranda/letters written in response to case situations. Write a letter of inquiry to a journal editor.

Designing Proposals—Dr. Phyllis McBride, Office of Proposal Development, VPR

✓ Assignment 6: Prepare a proposal for an article or a conference presentation. 
Scenario: A colleague in your discipline is planning a special issue on a topic. Graduate students are invited to submit one/two-page proposals for articles/presentations. Write the proposal and attach it to a letter to the person who is soliciting proposals for the special issue/conference.

Planning/writing the academic article and the popular article

✓ Assignments 7A: Write an article about a topic in your field of research. Article 7B: Target audience: general readers. Goal: Learn to explain your research to non-technical readers.

How to read an article at a conference; effective use of PowerPoint.

Developing the effective CV and application letter.

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of _____________________________
2. Course prefix, number and complete title _________________________________

3. Course description (not more than 50 words)

   This course is introducing the students to the research of Noise and Fluctuations. Noise and Fluctuations in electronics and other systems include virtually all scientific fields, including secure and non-secure communications, microprocessors, quantum information, mesoscopic systems, chemical sensing, corrosion diagnostics, neuro- and membrane-biology, biomedicine, etc.

4. Prerequisite(s) _____________________________ Cross-listed with _____________________________

   Cross-listed courses require the signatures of both department heads.

5. Is this a variable credit course? □ Yes □ No  If yes, from ______ to ________

6. Is this a repeatable course? □ Yes □ No  If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? □ Yes □ No

7. Has this course been taught as a 489/689? □ Yes □ No  If yes, how many times? ______ Indicate the number of students enrolled for each academic period it was taught. 11/15

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   MS, MEN, PhD in electrical and computer engineering

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation)

    EC EN 6 9 7 FLUCTU & NOISE ELECTR

    Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
    0 3 0 0 0 3 1 4 1 0 0 1 0 0 0 6 0 9 3 6 0 8 - 0 9 0 0 3 6 3 2

    Do not complete shaded area.

    Approval recommended by: _____________________________
    Head of Department Date: 4/9/07

    Chair, College Review Committee _____________________________
    Date: 4/19/07

    Dean of College _____________________________
    Date: 4/19/07

    Submitted to Coordinating Board by: _____________________________

    Date _____________________________

    Director of Academic Support Services
    Effective Date _____________________________

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
OAR/AS-5:04

N.K.ANAND
Fluctuations & Noise in Electronics

Instructor: Laszlo Kish
email: Laszlo.Kish@ece.tamu.edu  office: 312A Zachry  847-9071
regular office hours: Wednesday 16-17; random extra office hours: by email appointment

Goal: This interdisciplinary graduate course introduces the basic elements of noise and fluctuations and its research in physical and electronic systems and provides a startup material for noise in sensors and systems of neurons.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Classes</th>
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<tbody>
<tr>
<td>1 Noise in Physical Systems. Fundamental noise sources</td>
<td>5</td>
</tr>
<tr>
<td>2 Periodic, Pulse and Stochastic Signals</td>
<td>2</td>
</tr>
<tr>
<td>3 Noise Spectra of Important Fluctuations</td>
<td>3</td>
</tr>
<tr>
<td>4 Information Theory Aspects</td>
<td>2</td>
</tr>
<tr>
<td>5 Noise in Materials, incl. Diffusion and 1/f Noise</td>
<td>6</td>
</tr>
<tr>
<td>6 Noise Parameters of Linear Networks</td>
<td>6</td>
</tr>
<tr>
<td>7 Percolation and Noise</td>
<td>3</td>
</tr>
<tr>
<td>8 Noise in Passive and Active Devices</td>
<td>2</td>
</tr>
<tr>
<td>9 Noise Measurements</td>
<td>3</td>
</tr>
<tr>
<td>10 Noise in Nonlinear Systems, Stochastic Resonance</td>
<td>1</td>
</tr>
<tr>
<td>11 Noise Measurements as Tools in Physics and Electronics</td>
<td>1</td>
</tr>
<tr>
<td>12 Noise Aspects in Nanotechnology and Biology</td>
<td>1</td>
</tr>
<tr>
<td>13 Special Hot Topics:</td>
<td>7</td>
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<tr>
<td>14 Term paper presentations</td>
<td>3</td>
</tr>
</tbody>
</table>

Text: Hand-out material

Examinations and Grading:

First exam (40%),
Homework (20%)
Term Paper (40%)

Grades:
A: 90-100%
B: 80-89%
C: 60-79%
D: 40-59%
P: <40%

Homework: Non-submitted, or late-submitted: 0%
Submitted with correct results: 100%; calculation error -25%; methodical error: 0%

Americans with Disabilities Act Policy Statement: The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

Academic Integrity Statement: An Aggie does not lie, cheat, or steal or tolerate those who do.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and 25 copies. Attach a course syllabus to each.*

1. This request is submitted by the Department of Teaching, Learning and Culture

2. Course prefix, number and complete title: EDCI 603: Professional Development - Strategies for Teachers

3. Course description (not more than 50 words): Principles of organizational management, instructional design, and change theory in framing professional development programs.

4. Prerequisite(s) Graduate classification

5. Is this a variable credit course? □ Yes □ No If yes, from ______ to ______.

6. Is this a repeatable course? □ Yes □ No If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? □ Yes □ No

7. Has this course been taught as a 489/689? □ Yes □ No If yes, how many times? ______ 2 Indicate the number of students enrolled for each academic period it was taught. 05A=10; 06A=3

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   M.Ed. in Curriculum and Instruction

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix   | Course #   | Title (exclude punctuation)  
        |           | EDCI 603: Professional Development - Strategies for Teachers |

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>Subject Matter</th>
<th>Content Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
</tr>
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<td>1303010104</td>
<td>2804</td>
<td>07-08</td>
<td>010366</td>
</tr>
</tbody>
</table>

Approval recommended by:

Head of Department
Date

Head of Department (if cross-listed course) Date

Submitted to Coordinating Board by:

Dean of College
Date

Director of Academic Support Services
Date

Effective Date

* Attach a syllabus according to the guidelines on the Internet site www.tamu.edu/admissions/oaras. To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OAAS 10/89

21 of 82 C
EDCI 603  
Professional Development Strategies for Teachers  
3 Credit Hours

This course emphasizes principles of organizational management, instructional design and change theory in framing professional development programs. Substantial emphasizes will be placed on the professional development literature and how these ideas address individual and organizational needs for change using web-based delivery systems. I trust that you are motivated to work independently, because this course will be completely web-based. Guidance and asynchronous communication will be provided by e-mail, but the experience of working through the reading assignments and related tasks will require persistence and much self-directed effort.

UNIVERSITY POLICIES

Statement on ADA
The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Disability Services in Room B-118 in the Cain Building or call 845-1637.

Policy on Scholastic Dishonesty
Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. **An Aggie does not lie, cheat, or steal or tolerate those who do.** For additional information go to [http://www.tamu.edu/aggiehonor](http://www.tamu.edu/aggiehonor)

Plagiarism
The handouts used in this course are copyrighted. Because these materials are copyrighted, you do not have the right to copy the handouts unless permission is received. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the *Texas A&M University Student Rules*, under the section “Scholastic Dishonesty.”
Attendance

Attendance policy will be administered in accordance with Student Rule #7.

TEXTS


SELECTIONS FROM


Recent Paper


Professional Development Proposals

Two proposals developed and submitted for funding to federal agencies by Jon Denton over the past three years that will illustrate components needed for professional development proposals for school organizations.

Proposal 1: An On-line Alternative Certification Program at Texas A&M University

Proposal 2: Online NSBRI Instructional Resources Offered in Undergraduate and Graduate Science Education
My Overarching Instructional Goal of this course: Communicate with you about developing instructional systems and the frameworks for organizing professional development programs that will result in improving student academic performance.

Alignment of course objectives with NSES Professional Development Standards

<table>
<thead>
<tr>
<th>National Science Education Standard</th>
<th>603 Objectives.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard A. Professional development for teachers of science requires learning essential science content through the perspectives and methods of inquiry</td>
<td>1</td>
</tr>
<tr>
<td>Standard B. Professional development for teachers of science requires integrating knowledge of science, learning, pedagogy, and students; it also requires applying that knowledge to science teaching.</td>
<td>2 and 3</td>
</tr>
<tr>
<td>Standard C. Professional development for teachers of science requires building understanding and ability for lifelong learning.</td>
<td>1, 2 and 3</td>
</tr>
<tr>
<td>Standard D. Professional development for teachers of science must coherent and integrated.</td>
<td>1 - 4</td>
</tr>
</tbody>
</table>

OBJECTIVES

Students enrolled in EDCI 603 will be able to:

1. Distinguish nomothetic and ideographic factors affecting organizational management and change. This objective will be attained by analyzing variables influencing leaders and then constructing a matrix from both the nomothetic and ideographic perspectives. This objective will be achieved by developing and discussing a 16 cell matrix on nomothetic and ideographic factors affecting leadership strategies for professional development after reading selections from Sergiovanni & Starratt, Knapp, and the National Science Education Standards. This matrix will be submitted electronically using Microsoft word processing software and WebCT Vista.

2. Critically examine Professional Development design elements that positively affect student achievement. This objective will be attained through examining the
professional development literature from the Bruce and Showers text and developing an analysis of variables that must be included in successful (achievement producing effects) professional development programs considering nomothetic and ideographic perspectives addressed by Sergiovanni & Starratt. This analysis will take the form of adding design elements to each cell of the matrix developed in objective 1 and will be submitted electronically using Microsoft word processing software and WebCT Vista.

3. Compare and contrast Professional development models offered by Loucks-Horsley, Love, Stiles, Mundry & Hewson. This objective will be attained through examining the professional development models included in the Loucks-Horsley, et. al text and developing an analysis of how each model addresses key variables for successful professional development from nomothetic and ideographic perspectives. This analysis will take the form of a 1-2 page analysis for each of the 18 models and will be submitted electronically using Microsoft word processing software and WebCT Vista.

4. Develop a professional development framework (proposal) for a professional development program in your science department that will foster greater student achievement on the Texas Assessment of Knowledge & Skills in Science. This proposal will take the form of a 10 -15 page paper (font size 12, font style: Times New Roman) that provides the need for the professional development program and theoretical rationale (citing sources) that clearly address nomothetic and ideographic perspectives for the science department, delineates the objectives, provides a description of instructional program experiences, provides a schedule of events/experiences for the entire program, and provides formative and summative evaluation protocol for the professional development program. This plan will be submitted electronically using Microsoft word processing software and WebCT Vista.

**GRADING SYSTEM**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1 Development of management matrix</td>
<td>30</td>
</tr>
<tr>
<td>Objective 2 Analysis of PD variables</td>
<td>30</td>
</tr>
<tr>
<td>Objective 3 Analysis of PD models</td>
<td>30</td>
</tr>
<tr>
<td>Objective 4 Professional Development Plan for Science Dept</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total Points for Course</strong></td>
<td><strong>120</strong></td>
</tr>
</tbody>
</table>

**Course Grade**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Cumulative Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>108 - 120</td>
</tr>
<tr>
<td>B</td>
<td>96 - 107</td>
</tr>
<tr>
<td>C</td>
<td>84 - 95</td>
</tr>
</tbody>
</table>
Scoring scheme for management matrix (Objectives 1):
- Careful analysis of both nomothetic (achievement, adapatation, integration, maintenance) and ideographic (satisfaction, recognition, competence, security) dimensions affecting leadership in each cell @ 2pts/cell for 15 cells = 30 pts
- Grammatically correct prose with no spelling errors = 1 point (bonus point)

Scoring scheme for adding design elements to each cell (Objective 2):
- An analysis of variables that must be included in successful (achievement producing effects) professional development programs considering nomothetic and ideographic perspectives through adding design elements to each cell of the matrix developed in objective 1. 15 cells @ 2pt/cell = 30 points
- Grammatically correct prose with no spelling errors = 1 point (bonus point)

Scoring scheme for analysis of 18 professional development models (Objective 3):
- An analysis of each of the 18 professional development models provided in chapter 5 of Loucks-Horsley, et al text (Table 5.1) that includes assumptions, key elements, implementation requirements, ideographic and nomothetic dimensions best addressed by the model. 18 models @ 1.5 pt/model = 27 points.
- Grammatically correct prose with no spelling errors = 3 points

Scoring scheme for Prof Dev variables paper (Objective 4):

- Components of Proposal: This proposal will take the form of a 10-15 page paper (font size 12, font style: Times) that includes:
  - Need for the professional development program and theoretical rationale (citing sources) that clearly address nomothetic and ideographic perspectives for the science department (5 points);
  - Delineating objectives for the professional development program (5 points);
  - Description of instructional program experiences (5 points);
  - Schedule of events/experiences for the entire program (5 points);
  - Formative and summative evaluation protocols (5 points);
  - Follows American Psychological Association 5th edition for citations, references and format of paper (2 points)
  - Grammatically correct prose with no spelling errors (3 points)

Recycle Option on Management Matrix submissions (Objectives 1, 2 and 3):
You will have the opportunity to submit your assignments related to Objectives 1, 2 and 3 for review (formative assessment) and resubmit the deliverable if the score you receive is not what you expect. A maximum score of 25 points is possible with resubmitted papers for Objectives 1, 2 and 3.

Incomplete Grades
Incomplete grades are strongly discouraged. My experience over the past five years has been that the WebCT system changes each semester. These changes result in access difficulties creating additional delays and frustration. If an incomplete grade is absolutely necessary, realize a penalty of one letter grade will be assessed for choosing this option. That is, if you request an incomplete grade at the end of the semester and subsequently complete the point requirements for an “A” grade; you will be awarded a “B” grade. Further, after one semester, the incomplete grade will change automatically to an “F” grade.

DUE DATES
All papers (deliverables) are to be submitted electronically by the date designated in the following schedule:

- Prof. Dev. Management Matrix (Objective 1) due - February 17, 2007
- Prof. Dev. Variables added to matrix (Objective 2) due - March 10, 2007
- Prof. Dev Models analyses (Objective 3) due – April 7, 2007
- Professional development Proposal (Objective 4) due - May 5, 2007

READINGS SCHEDULE

January 16 through February 17

Weeks 1-5  Objective 1  Sergiovanni & Starratt, chapter 3;
            Nat. Sc. Ed. Stds, chapter 4;
            Knapp, chapter 3.

February 18 through March 10

Weeks 6-8  Objective 2  Joyce & Showers, chapters 1-9

Spring Break March 13 – 17

March 18 through April 7
NOTE: No-penalty to drop course ends April 2, 2007

Weeks 9 – 11  Objective 3  Loucks-Horsley, et al, chapters 2, 5

April 8 through May 5

Weeks 12-14  Objective 4  Denton professional development proposals
                and paper,
                Loucks-Horsley, et al, chapter 3

NOTE: Grades for graduating students due May 10, 2007 and May 12, 2007 for non-graduating students.
### WEEKLY SCHEDULE

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Jan 16 – 20</th>
<th>Chp. 3 Sergiovanni &amp; Starratt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>Jan 21 – 27</td>
<td>Chp. 4 NSES,</td>
</tr>
<tr>
<td>Week 3</td>
<td>Jan 28 – Feb 3</td>
<td>Chp 3 Knapp</td>
</tr>
<tr>
<td>Week 4</td>
<td>Feb 4 – 10</td>
<td>Develop matrix</td>
</tr>
<tr>
<td>Week 5</td>
<td>Feb 11 – 17</td>
<td>Objective 1 matrix analysis due</td>
</tr>
<tr>
<td>Week 6</td>
<td>Feb 18 – 24</td>
<td>Preface &amp; Chaps., 1, 2, 3, 4 Joyce &amp; Showers</td>
</tr>
<tr>
<td>Week 7</td>
<td>Feb 25 – Mar 3</td>
<td>Chaps. 5, 6, 7, 8, 9 Joyce &amp; Showers</td>
</tr>
<tr>
<td>Week 8</td>
<td>Mar 4 – 10</td>
<td>Objective 2 matrix additions due</td>
</tr>
<tr>
<td>Spring Break</td>
<td>Mar 13 – 17</td>
<td></td>
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<tr>
<td>Week 11</td>
<td>Apr 1 – 7</td>
<td>Objective 3 analysis due</td>
</tr>
<tr>
<td>Week 12</td>
<td>Apr 8 – 14</td>
<td>Loucks-Horsley, et al – Chap. 3</td>
</tr>
<tr>
<td>Week 13</td>
<td>Apr 15 – 21</td>
<td>Denton professional paper &amp; prof. dev proposals</td>
</tr>
<tr>
<td>Week 14</td>
<td>Apr 22 – 28</td>
<td>Develop proposal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Objective 4 proposal due</td>
</tr>
</tbody>
</table>

Also, please understand that the suggested submission dates for assignments are guides not absolutes.

DETAILED SCHEDULE with guide questions for assigned readings. Think of these questions/thoughts as the issues that would be brought up in a face-to-face class session.

### WEEK 1

The following questions occurred to me as I communicated with the authors during the reading of this chapter. The big ideas (principles and key concepts) in this chapter
published 34 years ago seem especially relevant to individuals considering professional development programs because as a developer and implementer of professional development programs, you will consider both the needs of the individual and the organization in carrying out your efforts. In this chapter, the authors spoke to the work of school supervisors. As these authors point out, professional development for changing aspects of school operations are key roles for supervisors and thus speak directly to the principles and key concepts in this course. As the course progresses, I will encourage you to continually consider whether the ideas of Sergiovanni & Starratt are consistent with the more recently published ideas.

Questions to ponder as you dialogue with Sergiovanni & Starratt in Chapter 3, The Nature of School Organizations.

- What do the authors mean that organizations may be viewed as living organisms having a composite of characteristics much as people have a variety of personality characteristics? (page 25) Ans. - Like individuals, organizations need to identify and pursue goals, react to stress, seek homeostasis, adapt, maintain themselves internally, ensure survival, eliminate uncertainty, and grow in size, power and experience if they are to function effectively.

- What factors influence organizational drift and planned change of organizations? (Page 26) Ans. – Being in control rather than being controlled by stress, disequilibrium, uncertainty, and changes in size and power. If the organization evolves, adjusts, and readjusts seemingly unaffected by conscious efforts of its members then organizational drift seems to be occurring. Planned change and conscious efforts by individuals in the organization to control the organization rather than being controlled by the organization are proactive actions by these individuals that are desired.

- What do the authors mean by the statement on page 26, “Organizations are notoriously satisfying as they follow their own impulses?” Ans. – organizational behavior often is not rational. That is, leaders and people in schools do not tend to seek the best solution among alternatives, but rather accept solutions that satisfies their current needs.

- What are four basic needs that all organizations must satisfy in order to survive as effective institutions? (pages 27-28) Ans. – Adaptation to: changing societal needs, technological resources, and multiple action committees with conflicting agenda; Achievement of school goals such as, student achievement, citizenship, student self-actualization, favorable dropout ratios, teacher growth and development; Integration of subunits within larger unit, such as, school rules with board policies and state regulations, curricular coordination within schools and across schools in district; Maintenance of values such as, morale, loyalty, cohesiveness of mission through communication of organization’s views.

- In order for effective leadership, leaders must understand that the social milieu of the organization involves an authority system, a compliance system, and a status system for any administrative action in a school. Power interactions of these systems usually involves conflict. Identify the opposing influence in the
following pairs of opposing factors of potential organizational conflict. (pages 30 – 31)
Individual vs. __________ Ans. - Organization
Management System vs. __________ Ans. - Technical system
Ability vs. __________ Ans. Authority
Bureaucratic inclinations vs. __________ Ans. Professional inclinations

• What are the structural, functional, and operational characteristics of a social systems approach to leadership (I have substituted leadership for administration)? (page 31) Ans. - Structurally leadership is considered to be a series of superordinate-subordinate relationships within a social system; Functionally these hierarchical relationships are the basis for allocating roles, personnel, and facilities to accomplish the school's goals; Operationally, leadership occurs in person-to-person interactions.

• Comment: Getzels and Guba considered the term, social systems as containing two interdependent dimensions (institution and individual). What features distinguish these dimensions according to Getzels and Guba? (pages 32 - 33) Ans. - Institutions have purposes, are structural, are normative, and are sanction-bearing. Institutions are operationally defined in terms of their subunit roles. These roles and expectations of their functions represent the positions, offices, and status prerogatives within the organization. Individuals have personalities and needs and comprise the human element within an organization's roles.

• What are the attributes of the nomothetic dimension of Getzels and Guba's social system approach to leadership? (Page 33 - 34) Ans. - Institutions are operationally defined in terms of their subunit roles. These roles and expectations of their functions represent the positions, offices, and status prerogatives within the organization. In the absence of individual personalities, the institutional dimension provides for maximum predictability in determining achievement of institutional goals. Depicted linearly the nomothetic dimension is Institution → Roles → Role Expectations → Achievement of Institutional Goals From this perspective, the organization strives to socialize the individual to its own image and ends. Conformity to the institutional dimension leads to institutional effectiveness.

• What are the attributes of the ideographic dimension of Getzels and Guba's social system approach to leadership? (Page 33 - 34) Ans. - Individuals have goals that are expressed through their personalities and pursued in terms of their need dispositions. Depicted linearly the ideographic dimension is Individual → Personality → Need Disposition → Achievement of Individual Goals From this perspective, individuals strive to socialize the organization to their own image and ends. Conformity to the individual dimension leads to individual efficiency.

• Getzels and Guba have suggested four general patterns for leadership based on their social systems model for administering an organization like a school. What are these styles and what does each style seek to achieve? (pages 34 –35) Ans. – 1. Nomothetic style where leadership behavior is directed to achieving school goals; 2. Ideographic style where leadership is directed to achieving individual
goals; 3. Compromise style where leadership is directed to achieving both school goals and individual goals in a satisfactory manner; 4. Transactional style where leadership acts on the belief that institutional and individual goals are interdependent and meeting meaningful individual goals results in achieving the organization’s goals.

- Sergiovanni & Starratt indicate there is a natural tendency of schools to adopt a conservative perspective. What qualities characterize a school with a conservative perspective? (page 36) Ans. – emphasis on maintaining the status quo, to avoid change thereby avoiding controversy and conflict.

- Comment: The authors (Sergiovanni & Starratt) use five pages (38 – 42) to label different types authority exhibited in organizations but do not define authority until they begin their discussion of organizational power. How do the authors distinguish authority from power in and organizational sense? (page 43) Ans. – authority is a broad basis for action not directed at any particular individual, while power is derived from authority and is directed at achieving individual or group compliance.

- What type of organizational power appears to work best in colleges (educational institutions) according to the authors? (pages 43-46) Ans. – Expert power or ability to command compliance on the basis of professional knowledge, information and skills. The authors assume this power is also best for all educational institutions.

- What reasons do the authors give for status systems playing a role in a school organization? (page 48) Ans. – rewards associated with status should be present in the social structure to ensure that those who are capable of performing essential societal and organizational tasks do indeed perform them. In schools, stratification provides stability over time and the protection of continuity for community clients and beneficiaries.

- What are the symptoms of a status system gone bad? (page 49) Ans. – inflexibility, low responsiveness, infrequent and one-way communication patterns, low organizational commitment, teacher and student dissatisfaction, and low adaptiveness.

WEEK 2
Questions to ponder as you dialogue with the Committee who developed the National Science Education Standards (NSES) for Professional Development of Science Teachers Chapter 4

Comment: This chapter presents Professional Development from the perspective of the science community as to the needs of the individual science teacher. In other words, the focus is on the ideographic dimension of a social organization.

1. What are the assumptions underlying the professional Development Standards presented by the National Science Education Standards? (pages 56 – 58) Ans. – Professional development for a science teacher is: 1. a continuous, lifelong process; 2. to create optimal collaborative learning experiences where best
sources of expertise are matched to experience and current needs of teachers; 3. composed of activities that must be sustained, and require participation and reflection; 4. conducted in the contexts where the teachers’ understandings and abilities will be used, i.e., classrooms and schools.

2. What and how much science content knowledge is needed by classroom teachers? (page 59) Ans. – All teachers of science must have a strong, broad base of scientific knowledge extensive enough for them to understand and apply 1. skills associated with the nature of scientific inquiry; 2. fundamental concepts in major science disciplines; 3. science concepts to make connections within and across science disciplines, mathematics, technology, and other school subjects; 4. concepts and processes to deal with personal and societal issues.

3. What “test” of needed scientific knowledge by teachers does the standards pose? (Page 60) Ans. – sufficient teacher know-how is needed to determine what students understand about science and to use these data to develop instructional strategies to extend students’ understanding of science concepts and principles.

4. What is pedagogical content knowledge according to the NSES? (page 62) Ans. – Skilled teachers have special understandings and abilities that integrate their knowledge of science content, curriculum, learning, teaching, and students. Such knowledge allows teachers to tailor instructional experiences to individuals and groups.

5. More about pedagogical content knowledge – (pages 62 –63). Teachers with extensive pedagogical content knowledge will have a sense of what their students likely will know, what they will learn quickly, and what will be a struggle. These teachers are truly diagnosticians who understand students’ ideas, beliefs and reasoning with respect to the concepts and principles they teach.

6. How is Pedagogical Content Knowledge developed? (page 63) Ans. – It can be developed only through continuous experience. Teachers must have opportunities to engage in analysis of science concepts and principles, learning and pedagogy and make connections among them.

7. Why is teacher learning analogous to student learning according to NCES? (page 68) Ans. – Learning to teach science requires that the teacher articulate questions, pursue answers to those questions, interpret information gathered, propose applications, and fit the new learning into the larger picture of teaching science.

8. What reasons are offered by NCES for providing professional development for teachers? (page 68) Ans. – 1. to keep current in science; 2. to attend to changing student needs; 3. to keep up with evolving protocols for teaching.


10. What organizational norms are needed to foster the Transactional style of leadership that blends ideographic and nomothetic dimensions of an organization? NOTE: I am blatantly asking you to link Getzels & Guba’s work to NCES notions
about professional development (page 69) Ans. -- organizational norms of risk-taking, trust and collegial support, careful and dedicated inquiry.

11. What long-standing problem is associated with Professional Development of teachers? (page 70) Ans. -- professional development efforts are too often a random combination of courses, conferences, research experiences, workshops, networking opportunities, internships, mentoring relationships. More coherence is sorely needed! Again, it seems to me that Getzels & Guba's model speaks to this problem what do you think?

12. What attributes of Professional Development programs are called for by NCES? (page 71) Ans. -- flexibility (must account for differing degrees and forms of expertise represented in groups); varied content (technical skills, evolving content in science and pedagogy, and human development); extended time period (time to provide opportunities to teachers to refine continually their knowledge and abilities); individual choice (individual choices that enable meeting individual needs as well as organizational goal attainment); transactional organizational climate (leadership acts on the belief that institutional and individual goals are interdependent and meeting meaningful individual goals results in achieving the organization's goals.)

WEEK 3

Questions to ponder as you dialogue with Michael Knapp, the author of Chapter 4, Professional Development as a Policy Pathway. Review of Research in Education, (2003): volume 27

Comment: This chapter presents Professional Development from the perspective of the organization, although the organization presented is the school, school district and even the state. In other words, the focus is on the nomothetic dimension of a social organization.

1. What issues affect leaders decisions with professional development initiatives? (pages 109 -110) Ans. -- Investment levels (how much from what sources); Evidence base (what counts as evidence the investment yielded desired returns); Structures (what formal venues and frameworks are needed that provide for: the decision-making positions and groups that are in place, procedures for decision-making, the quality of leadership, assignment of people, and scheduling of time are attributes of an organization's leadership structure); Content focus (how should the content focus be determined and who should decide); Expertise (where to locate expertise and cultivate it for long-term programs); Incentives and norms (what norms and cultural supports can be nurtured to encourage participation; Accountability (how should participants, providers and leaders hold themselves responsible for learning from the pd program); Connection to the reform agenda (how closely should professional development program be tied to a larger reform agenda); Constituency for professional development (development of political support inside and outside the educational system).
2. The author uses "professional and student learning" as the first major heading in the chapter. How is learning defined for these intended audiences? (page 114) 

An. - For students - master challenging content and skills in subject areas, develop habits of mind for further learning, and preparing for fulfilling occupational futures and citizenship in a democracy. For the professional - learning is defined as demonstrable changes in professionally relevant thinking, knowledge, skills, habits of mind, or commitments, all of which constitute the capacity for practice.

3. What are the institutional or nomothetic goals specified for professional development inspired by a standards-based reform context listed by Mr. Knapp? (page 115). An. – high level of subject matter competence; appropriate pedagogical knowledge to engage diverse learners in content learning; commitment to standards-based practice; assessment approaches to determine if students are meeting standards.

4. Where does professional development occur? (page 115) An. – professional development takes place both within practice itself and in settings outside of practice (e.g., workshops, courses, reading journals, spontaneous conversations with colleagues, conference sessions, yearlong study groups)

5. What tools or processes are most often used by leaders in establishing a professional development activity/program? (page 117) An. – Broad signals (messages sent out about the purposes, role or focus of a professional development initiative); Requirements (providing funding guidelines, establishing processes by which professional development agendas will be framed, specifying the amount, kind, content of pd activities); Resource allocation (distribution of funds, time, personnel, expertise); Information flow (structures and specifications that require the availability of particular information for professional development activities); Authority allocation (assignment of responsibility for professional development within and across the school district); Incentives (sanctions and rewards [usually financial] to motivate responses); Assistance mechanisms (structures, personnel, and other resources to help units respond to professional development initiatives).

6. What are the characteristics of professional development that counts most in supporting the teacher and student learning in standards-based reform contexts? (pages 119 –120) An. - concentrate on classroom practice that emphasizes high standards and evidence of student achievement; focus on pedagogical content knowledge; model preferred instructional practices both in classrooms and adult learning situations; locate professional development experiences in collaborative, school-based environments; offer rigorous and cumulative opportunities over time; align with reform initiatives.

7. What characteristics of professional development activities promote the greatest degree of implementation according to self-report data from classroom teachers? (pages 121 – 122) An. - Activity takes the form of study groups, mentoring, coaching that is school focused and job embedded; is continuous and long term (minimum of 40 – 50 hours); requires collective participation; emphasizes deepening teachers’ knowledge of content and students learn that content;
incorporates active learning by teachers in professional development activities; promotes coherent connections among curriculum, instruction and assessment.

8. How do district policies influence conditions that support professional learning? (page 122 – 123) Ans. Policies should include sections addressing: District mandates; District inducements; District-initiated capacity building; District-orchestrated systemic change.

9. Comment: Mr. Knapp uses the case of New York City Community School District 2 to illustrate how this school district applied policy directives to support professional development see pages 123 – 126.

10. Comment: Mr. Knapp provides six district case studies that support district strategies for: increasing district-wide instructional leadership capacity, diversifying opportunities and venues for pd, strengthening professional communities within and among schools in district, balancing between autonomy and district directives, engaging external professional development providers, using external pressure. (see pages 126 – 136).

11. Comment: The final section of Mr. Knapp’s chapter examines state strategies that support professional development (see pages 136 – 146). As you read this section think of various initiatives that the Texas Education Agency has employed and compare them with strategies used in Kentucky and Connecticut.

WEEKS 4-5
Assignment (suggested time schedule for weeks 4 & 5 listed at the end of the example)

Your initial deliverable for this course is to complete and describe each cell in a data retrieval matrix or organizational framework for thinking about the Getzels-Guba social systems model of organizational management as it relates to professional development for science educators. This framework will be used throughout the course in examining the assigned literature on professional development for science teachers.

Background: The nomothetic goals (achievement, adaptation, integration, and maintenance) are presented in the Sergiovanni & Starratt reading selection across pages 27 – 29. On page 29, the authors note that achievement and adaptation will involve “change goals” for the organization that increase the need for greater emphasis on professional development, while integration and maintenance represent “steady state” goals for the organization to continue accomplishing the goals it is noted for at present. Professional development programs for the “steady state goals” will not be as resource intensive as for the “change goals.” The ideographic goals (satisfaction, recognition, competence and security) are based on “job satisfaction descriptors” that can be traced to Maslow’s hierarchy of needs. From this perspective, satisfaction and recognition are “higher order” goals for the individual that evolve after competence and security have been achieved.

Putting this information together, we can classify the 16 cells for professional development programs in the following Nomothetic-Ideographic matrix in terms of their relative importance.
• Cells 1, 2, 5, 6 represent highly valued goals for both the organization and the individual
• Cells 3, 4, 7, 8 represent highly valued goals for the organization yet basic goals for the individual
• Cells 9, 10, 13, 14 represent continuing operations/status goals for the organization and highly valued goals for the individuals in the organization
• Cells 11, 12, 15, 16 represent continuing operations/status goals for the organization yet basic goals for the individuals in the organization

<table>
<thead>
<tr>
<th></th>
<th>Nomothetic</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Achievement</td>
<td>Adaptation</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Ideographic</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Goals</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Security</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

**Directions:** Your task is to complete each of the 16 cells in this matrix using the following variables and your understanding of the Ideographic and Nomothetic dimensions of the Getzels-Guba social systems model for organizational leadership. CELL 15 has been completed to illustrate how the six step process may appear.

1. Specify the Ideographic and Nomothetic goals for each cell in the matrix.

2. Think about how the Ideographic goal(s) and the Nomothetic Goal(s) interact in a particular cell in deciding which of Knapp's variables and which of the NSSE goals best fit in the cell and briefly describe each entry. Recommendation: Keep the number of entries per cell for 1-2 Knapp variables and 1-2 entries per cell for NSSE goals. Also, keep in mind the descriptions may need to be modified given the interaction of the cell goals and the relative importance of the goals represented by the cell.

• Use one or more of Knapp’s Policy Variables affecting Professional Development as entries in each of the cells from a Nomothetic perspective. These variables include: Investment levels, Evidence base, Structures, Content Focus, Expertise, Incentives & Norms, Accountability, Connection to Reform Agenda, Constituency for Professional Development

• Use one or more of the following National Science Education Standards Goals for Professional Development as entries in each of the cells from an Ideographic perspective. These goals include: lifelong learning; norms of risk-taking and collegial support; expertise in science content; expertise in pedagogical content knowledge; sustained program of professional development; classroom context for professional development; collaboration and reflection.
3. Ideally all 16 cells would be optimally served by a transactional leadership style, but given the different organizations and professional workforces in those organizations, consider the leadership style best suited for cells to be as follows:
   - Transactional leadership – cells 1, 2, 5, 6
   - Nomothetic leadership – cells 3, 4, 7, 8
   - Ideographic leadership – cells 9, 10, 13, 14
   - Compromise leadership – cells 11, 12, 15, 16

4. Finally, briefly discuss how the interaction of nomothetic and ideographic goals in each cell affects authority and power expressions by leadership described by that cell.

NOTE: The following examples for Cell 15 of the matrix is provided to serve as a guide for the format and organization of the matrix that you will develop. Please present your cell description in 1 to 2 pages using Times New Roman, size 12 font and single spacing.

Cell 15

Step 1: Specify the Ideographic and Nomothetic Goals for each cell

<table>
<thead>
<tr>
<th>Nomothetic Goal</th>
<th>Ideographic Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of organization</td>
<td>Competence of the science educator</td>
</tr>
<tr>
<td>Accountability, Structures</td>
<td>Expertise in pedagogical content knowledge;</td>
</tr>
<tr>
<td></td>
<td>Classroom context for professional development</td>
</tr>
</tbody>
</table>

Step 2: Specify Knapp variables and NSES goals and briefly discuss how they help meet the goals for that cell, i.e., maintenance and competence.

Accountability (Knapp)—Performance of teachers in classrooms that reflects professional development program and student performance on state assessments of those teachers.

Structures (Knapp)—The Professional Development plan is organized from the Superintendent’s office (central administration) with a well defined framework, objectives, timeline and accountability measures specified

Expertise in Pedagogical Content Knowledge (NSES & Knapp)—Outcome variable school district will employ to determine whether teachers have increased their teaching
competence in science taking into account their experience with students and participation in the district's professional development program.

**Classroom Context for Professional Development (NSES)**- Outcome variable school district will employ to determine whether teachers participating in professional development actually incorporated knowledge/skills addressed in professional development program.

**Step 3:** *Next, a decision is rendered and supported with a rationale about the leadership style that would likely occur for this mix of goals and variables.*

Given the goals for Cell 15, a compromise leadership style that emphasizes the needs of the organization first with some emphasis on individuals being used to determine what content would be addressed. Structurally, the leader would be vested with formal authority given her/his position with the roles of professional development planning and delivery being based on the hierarchy of relationships in the system.

**Step 4:** *Finally, briefly discuss how this leadership style supports a particular authority, and power associated with leadership.*

The bases for authority in Cell 15 is formal authority associated with legal codes, positions of administrators and their legitimacy to lead. Secondary authority of competence will come into play as professional development specialists are designated to develop and implement programs. The corresponding power types applied by leadership described by Cell 15 is legitimate power, reward power and coercive power at the implementation level.

**Week 4 Deliverable** – Complete Steps 1 & 2 for the 15 remaining cells in the matrix and submit for a free (no point deduction) formative assessment of the initial development of your matrix.

**Week 5 Deliverable** – Complete all 4 steps of matrix for each cell, given feedback on steps 1 & 2.

**WEEK 6**
Questions to ponder as you dialogue with Bruce Joyce and Beverly Showers about their views in *Student Achievement Through Staff Development* (2002) in Chapters 1 – 4.

Chapter 1 Student Learning as the goal: Learning by Everyone as an Ethos – The proposition of Joyce and Showers is that if a teacher or a community of teachers engages for a dozen days during the school year, in the formal study of curriculum and instructional strategies and then regularly monitors their implementation and consequent student learning, the odds are that student achievement will rise substantially.
1. What four conditions must be present if staff development is to significantly affect student achievement? (page 4) Ans. – a. A community of professionals study together, put their ideas into practice and share the results; b. The content of staff development evolves around curricular and instructional strategies that have high probability of increasing student ability to learn; c. The magnitude of change in student learning is evident and significant; d. The processes of staff development emphasize skills to implement what they are learning.

2. What factors have the greatest influence in bringing about high student achievement? (page 6) Ans. – The proximal – distal continuum. Proximal end (the home) – intermediate along the continuum (school) – distal (economic and political systems). A change in parenting can have a considerable and immediate impact. A change in curriculum and instruction (through staff development) can impact achievement as well, while changes in economic and political conditions usually have a more gradual and lesser effect.

3. What is Effect Size and why use it? (page 7) – Ans. – this concept is used to describe the magnitude of change due to educational practice of a treatment group and control group compared to the standard deviation of group performance (spread of scores). In equation form E. S. (effect size) = [Mean of treatment group – Mean of control group]/Standard deviation of control group. An effect size of .3 or greater is sufficient to recognize the treatment is having a noticeable effect from observations made by educators.

4. Comment – (page 10) – My interpretation of the authors’ perspectives in this chapter is that the goals for any professional development system are to: establish nurturing learning communities, inject new knowledge and excitement into the classroom, and engage students in successful instructional experiences.

Chapter 2 Testing the Proposition: Cases in Point

1. What professional development content according to the authors will result in increased student learning? (page 11) – Ans. – Only content dealing with curriculum & instruction or the overall social climate of the schools is likely to considerably improve student learning.

2. What attributes of professional development programs are essential? (page 12) – Ans. Ongoing systems with established goals for student learning; new content provided; time and structure for collaborative work is scheduled; student performance data continuously collected and analyzed for decisions about program.

3. How long should successful professional development programs be implemented? (page 12) – Professional development programs do not end until faculties are actually using their new skills and knowledge to affect the learning environments of their students. or stated another way, pd continues until transfer of skills & knowledge are achieved.

4. What professional development goals are most important? (page 12) – Ans. Clearly specified student learning goals. Directly related to the student learning goals are formative assessment processes to determine whether goals are being met are most important.
Comment: The remaining sections in this chapter present 6 cases (pages 13 – 33) to illustrate that quality professional development programs can impact student achievement – even in a relatively brief time period. Please review the final 3 pages (pages 33 –35) carefully for observations and other sources about establishing powerful professional development programs.

Chapter 3 Sources of Tested Content: Inquiries on Teaching and Learning

1. What are the reasons both pro and con for a knowledge base about teaching? (pages 37 – 41) Ans. – Two sources the authors cite (Wang, Haertel & Walberg, 1993; and Pickering & Pollock, 2001) provide considerable support for a knowledge base about teaching. Conversely, a “paradigm shift” in educational research over the past decade or so argues that cultures, genders, and learning styles are so different that good teaching depends on contextual nuances and variables rather than empirically based programmatic research.

2. What inquiry into information-processing has occurred? (pages 44 – 48) – Ans. Methods for presenting information so students can learn and use information more conceptually; systems to aid memorization and organize material for mastery; models to teach students to conceptually organize information; methods of the disciplines to engage in causal reasoning, and to master concepts.

3. What has inquiry into cooperative learning models produced? (pages 48 – 51) Ans. Research on cooperative learning is overwhelmingly positive. The more intensely cooperative the environment, the greater the effects. And the more complex the outcomes (higher order cognitive processing, problem solving) the greater the results.

4. What are the significant issues of focusing teaching and learning on the student? (pages 51 – 54) Ans. Joyce and Showers question the idea of tailoring instruction under approaches for gender, ethnicities, and socioeconomic groups because they believe the most effective approaches accommodate and actually capitalize on individual differences rather than dividing students under categories and teaching them as separate from one another.

Comment – Please reflect on the six bullet statements on page 55 that aptly summarize the chapter. Perhaps the sentence that I had to really experience and struggle with across the years is “The learner does the learning!”

Chapter 4: Choosing Content: Teaching Students How to Learn

Who decides the content of professional development? (pages 59 – 60) Ans. – Selecting content for professional development should be a highly collaborative process usually established by a professional development council. Ideally a heavy reliance on shared data for decision making occurs to guide actions of the council.

Comment: Key ideas from chapter 4

- Selection of content for pd programs is a critical activity
- Selecting content by a council is a rational process of selecting content from alternatives that are aligned with district and school goals.
Schools are served by prioritizing goals, selecting content aligned with the prioritized goals.

Selecting providers for pd programs who have a clear understanding of the goals and processes of the school and school district.

Individuals will evaluate whether personal needs are being met, whereas schools and the school district will determine if needs for groups of students are being met.

WEEK 7

Chapter 5: Designing Training and Peer Coaching: Our Needs for Learning

This chapter is organized around the following goals.

- Provide training that enables people to gain knowledge and skills to transfer to active classroom practice.
- Seek training processes that increase the aptitude of faculties to learn new knowledge and skills more easily and effectively.

What are the types of outcomes that typically are targeted in professional development programs? (page 71) – Ans. 1. Knowledge/awareness of educational theories, new curricula, new advances in content disciplines; 2. Positive attitude development toward self, students, academic content; 3. Skill development of new classroom instructional processes; 4. Transfer of training and “executive control” of new skill/knowledge into classroom practice.

What training components (instructional activities) are most commonly applied in pd programs and what are their effects? (pages 73 – 79) Ans. Formal presentations of theory (lectures, directed readings), demonstrations or modeling, practice and peer coaching. To bring a teaching model of medium complexity under the teacher’s executive control requires 20 - 25 trials in the classroom over 8 – 10 weeks.

Comment: please attend to the author’s observations about the potential effects of different training components in pages 76 – 77, remembering that transfer of targeted knowledge/skills requires extensive trials and activities with maximum results occurring when peer coaching is part of the training package. Note Figure 5.2 (page 78) for a rule-of-thumb reference on training activities and outcomes.

What skills, attributes do teachers need to consider in acquiring new classroom practices? (pages 79 – 83) Ans. challenges of transfer - introducing a new teaching procedure generally creates dislocation and discomfort; Teaching new classroom behaviors creates student discomfort with change and often results in a student campaign to return to their comfort zone by abandoning the new practice; Questioning the cognitive demands of the new practice is often noted when teachers indicate their pd experiences are “too theoretical”; Productive use of peers substantially increase the mastery and use of innovative practices: Flexibility or
being willing to experiment with one's own behavior is a very functional attribute in acquiring new classroom practices.

Comment: A major portion of this chapter (pages 83 – 94) is devoted to "coaching" because peer coaching is such a powerful factor in bringing about classroom innovations that positively affect student learning. Please attend to the authors' comments, guidelines and observations about coaching because of it’s potential for establishing a powerful pd program. Some of the observations about peer coaching include:

- Coaching occurs when experts (outside or peers) present underlying theory of a skill or complex idea, model or demonstrate skills or problem solving using complex idea, provides opportunities for practice, and then provides structured and open-ended feedback for in-class practice episodes.
- Continuing technical assistance, whether provided by outside expert or by peer experts, results in much greater classroom implementation than is achieved by teachers who share initial training experiences but do not have long-term support of coaching.
- Coached teachers and principals generally practiced new strategies and developed greater skill with a new teaching strategy than un-coached educators who experienced the same initial skill training.
- Coached teachers used their new instructional strategies more appropriately than un-coached teachers in terms of their instructional objectives and the theories of models of teaching.
- Coached teachers exhibit greater long-term retention of knowledge and skill with strategies in which they have been coached.
- Coached teachers were more likely to explain new models of teaching to their students, ensuring that students understood the purpose of the strategy and behaviors expected of them with the new strategy.

Chapter 6 Implementation: Moving from Workshops to the Classroom
Joyce and Showers note that implementation is where promising innovations of classroom practices happen or fall apart. The ideas put forth in this chapter examine how implementation is monitored. The primary reason to monitor implementation of innovations is to interpret its effect on students. In addition, implementation data serve as a gauge of the school's capacity to make a decision and act upon it.

What human behaviors affect variations in implementation of an innovation? (pages 101 – 103) Ans. Teachers who participate fully in both formal and informal pd activities also tend to have well developed personal development interests.

Comment: Joyce and Showers have developed a rubric consisting of 5 levels for assessing states of growth of teachers (imitative use, mechanical use, routine use, integrated use, executive use) engaged in pd programs. See pages 101 – 106 for a description and application of this rubric.
Comment: Joyce and Showers report from their implementation studies that no relationship between years of teaching experience and the willingness and ability of teachers to engage in professional growth. See pages 107 – 113 for observations the authors have made from tracking implementation of pd programs.

Chapter 7 Inquiry and Evaluation: Learning what our students are learning
Joyce and Showers begin this chapter with the statement, Then only real evaluation is whether students learn more. And the only real issue in evaluation is whether we study student learning as a consequence if what we as teachers learn in curriculum, instruction and the social climate of the school.

The following questions are posed by the authors for evaluating a professional development program in terms of the content, the people served by the program, and whether the program is functioning optimally. See pages 119 – 127

- Who is served and what affects participation? (page 119) One solution - count the number of participants and their characteristics
- What happens to the content? (page 121) Underlying questions – How much of the content finds its way into practice< Does the use of this content persist? What are the perceptions of its effects?
- Are the participants studying the effects on their students? (page 122) The pd experience will provide strategies for determining student performance differences using the innovation(s).
- What do people think about their experiences? (page 123) First impressions can be deceptive and do not predict very well whether the innovation will be used; Closed-ended items need to be few and not redundant (Denton’s personal observation not more than 5 items!); Be careful about using a general questionnaire; Be careful about “charming the response” on participant perceptions of pd activities.

Chapter 8 People and Initiatives: Studying States of Growth

The authors note, “We teach not only what we know but what we are.” That idea resonates with me because this idea reveals that it is not only important to take the learner’s perspective into account, but also our personal views as teachers of learning, development, and teaching.

What affirmations do Joyce and Showers state for establishing a democratically operated pd program? (page 146) Ans. 1. Teachers are capable learners and are able to master a wide range of curricular and instructional strategies and use them effectively in the classroom. 2. Professional development programs can be designed to help educators increase their learning capacity: 3. Educators have a tendency to respond affirmatively to a positive social and organizational climate, and will create one if the opportunity is afforded them.
What levels of activity occur toward professional growth in educational organizations? (pages 151 - 157) *Ans. More active people view the environment as possibilities for growth, while less active folks expend energy in preserving the current state of affairs.*

Chapter 9 Creating Communities in Districts and Schools: The Organizational Aspects of Learning Environments

The authors refer to nomothetic and ideographic dimensions of organizations in the beginning of this chapter. Observations presented by the authors include:

- In most school districts central office administrators, building administrators and teachers are better linked to maintenance than to implementing innovations in curriculum & instruction. (page 162)
- School improvement efforts are organized with temporary, ad hoc arrangements that lose steam as the innovation loses luster. (page 163)
- Many educators have a maintenance orientation due to the belief that problems of achievement are student and home characteristics rather than problems of curriculum and instruction. (page 163)

What are the “accepting” and “elevating” belief systems of educators? (page 164) *Ans. In an accepting view, students are accepted as they are and the educational system is not viewed critically; it is accepted as the normative way of educating students. In an elevating view, students are viewed as emerging and flexible, and the task of schooling is to enhance their potential.*

WEEK 8

Your SECOND deliverable (objective 2) for this course is to extend each cell in a data retrieval matrix or organizational framework for thinking about the Getzels-Guba social systems model of organizational management as it relates to professional development design elements as described by Joyce & Showers.

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<thead>
<tr>
<th></th>
<th>Nomothetic</th>
<th>Goals</th>
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<tr>
<td></td>
<td>Achievement</td>
<td>Adaptation</td>
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<td>Satisfaction</td>
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<td>Ideographic</td>
<td>Recognition</td>
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<td>Goals</td>
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<tr>
<td>Security</td>
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*Directions:* Your task is to extend each of the 16 cells in this matrix using the following variables and your understanding of the Ideographic and Nomothetic dimensions of the Getzels-Guba social systems model for organizational leadership. CELL 15 has been expanded to illustrate how the additional process may appear.

Step 5 of matrix development:
• Specify up to 4 (e.g., A1, A4, D3, F1) of the following design elements that best apply for each cell in the matrix; and
• Briefly describe how the elements support the ideographic and nomothetic dimensions of that cell.

Thirty-three (33) Design Elements for pd programs suggested by Joyce and Showers.

A. Affirmations for establishing a democratically operated pd program.
1. Teachers are capable learners and are able to master a wide range of curricular and instructional strategies and use them effectively in the classroom.
2. Professional development programs can be designed to help educators increase their learning capacity;
3. Educators have a tendency to respond affirmatively to a positive social and organizational climate, and will create one if the opportunity is afforded them.
4. Community of professionals who study together, put into practice and share results for an extended period with an emphasis on implementation.
5. Programs of pd continue at least until faculty members are using content (skills and knowledge) in their teaching.

B. Desired Outcomes (goals) of pd programs usually fit under the following 4 areas:
1. Knowledge/awareness of educational theories, new curricula, new advances in content disciplines;
2. Positive attitude development toward self, students, academic content;
3. Skill development of new classroom instructional processes; and
4. Transfer of training and executive control of new skill/knowledge into classroom practice.

C. The pd models that succeed will teach students more effective ways of constructing knowledge and building skills
1. The pd program includes goals for student learning.
2. The learner does the learning, thus the focus must be on creating more powerful learners.
3. As students learn more about how to learn, demographic factors will be greatly reduced as learning barriers.
4. Capitalize on individual differences to create a more powerful learner.
5. Student performance continually monitored and used to adjust pd.

D. Selecting content for pd should be a highly collaborative process that places a premium on shared data for decisions
1. Content selection often is established by a pd council.
2. Content selection should be a rational process of selecting content from alternatives that are aligned with district and school goals.
3. A sound strategy is to prioritize goals and then select content aligned with the prioritized goals.
4. Select pd providers who have clear understanding of goals and operations of the school and school district.
5. New content selected for pd should center on curriculum & instruction strategies or social climate strategies that have high probability of increasing student learning

E. Training components (activities) most commonly used in pd programs and their effects
1. Formal presentations of theory (lectures, directed readings), demonstrations or modeling, practice and peer coaching are commonly used activities.
2. Where classroom skills are the desired outcomes, multiple activities (Formal presentations of theory [lectures, directed readings], demonstrations or modeling, and practice are needed for best results.
3. To bring a teaching model of medium complexity under the teacher’s executive control requires 20 - 25 trials in the classroom over 8 – 10 weeks using a full array of activities (Formal presentations of theory [lectures, directed readings], demonstrations or modeling, practice and peer coaching).
4. Coaching that provides continuing technical assistance, whether provided by outside expert or by peer experts, results in much greater classroom implementation than is achieved by teachers who share initial training experiences but do not have long-term support of coaching.

F. Factors influencing Implementation of pd programs
1. There is no relationship between years of teaching experience and the willingness to engage in professional growth opportunities.
2. A needed attribute for acquiring new classroom practices is flexibility or being willing to experiment with one’s own behavior.
3. More active people view the environment as possibilities for growth, while less active folks expend energy in preserving the current state of affairs.
4. In most school districts central office administrators, building administrators and teachers are better linked to maintenance than to implementing innovations in curriculum & instruction.
5. School improvement efforts that are organized with temporary, ad hoc arrangements lose steam as the innovation loses luster.
6. Many educators have a maintenance orientation due to the belief that problems of achievement are student and home characteristics rather than problems of curriculum and Instruction.

G. The primary reason to monitor implementation of a pd program is to interpret its (the pd program) effect.
1. A variety of levels of use or implementation inventories have been developed to determine teacher growth with a classroom innovation. Joyce and Showers present a rubric of imitative use, mechanical use, routine use, integrated use and executive use while another oft-cited change model examines how the teacher addresses self-oriented issues (What is it? How will it affect me?) to

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task-oriented issues (How do I do it? How can I use these materials more effectively?) to impact issues (Is this strategy working for my students?)

2. In evaluating pd programs, the only real issue is whether we study student learning as a consequence of the pd program.

3. An evaluation issue is “how much of the pd content finds its way into practice?”

4. Another evaluation issue “Does the use of this pd content persist?”

5. In evaluating content of pd programs, individuals assess whether personal needs are being met, whereas schools and school district leaders assess whether student performance needs are being met.

Cell 15

Step 1: Specify the Ideographic and Nomothetic Goals for each cell

Nomothetic Goal
Maintenance of organization
Accountability, Structures

Ideographic Goal
Competence of the science educator
Expertise in pedagogical content knowledge;
Classroom context for professional development

Step 2: Specify Knapp variables and NSES goals and briefly discuss how they help meet the goals for that cell, i.e., maintenance and competence:

Accountability (Knapp)— Performance of teachers in classrooms that reflects professional development program and student performance on state assessments of those teachers.

Structures (Knapp)— The Professional Development plan is organized from the Superintendent’s office (central administration) with a well defined framework, objectives, timeline and accountability measures specified

Expertise in Pedagogical Content Knowledge (NSES & Knapp)— Outcome variable school district will employ to determine whether teachers have increased their teaching competence in science taking into account their experience with students and participation in the district’s professional development program.

Classroom Context for Professional Development (NSES)— Outcome variable school district will employ to determine whether teachers participating in professional development actually incorporated knowledge/skills addressed in professional development program
Step 3: Next, a decision is rendered and supported with a rationale about the leadership style that would likely occur for this mix of goals and variables.

Given the goals for Cell 15, a compromise leadership style that emphasizes the needs of the organization first with some emphasis on individuals being used to determine what content would be addressed. Structurally, the leader would be vested with formal authority given her/his position with the roles of professional development planning and delivery being based on the hierarchy of relationships in the system.

Step 4: Finally, briefly discuss how this leadership style supports a particular authority, and power associated with leadership.

The bases for authority in Cell 15 is formal authority associated with legal codes, positions of administrators and their legitimacy to lead. Secondary authority of competence will come into play as professional development specialists are designated to develop and implement programs. The corresponding power types applied by leadership described by Cell 15 is legitimate power, reward power and expert power at the implementation level.

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Specify the professional development design elements that best apply for each cell in the matrix and briefly describe how they support the leadership and authority dimensions of that cell.
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Design Element 81: Other than goals of pd programs usually fit under the following areas: knowledge/awareness of educational theories, new curricula, new advances in content disciplines. For this cell, administrative, pedagogical, content is seen as very important and the plan is organized from the superintendent's office. Under these conditions, it is reasonable that an emphasis on knowledge/awareness of new advances in the content discipline would be needed.
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Design Element 84, 85, 86: While policy people see the environment as possibilities for growth while less active folks expend energy in preserving the current state of affairs
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- In most school districts central office administrators, building administrators and teachers are better linked to maintenance than to implementing innovations in curriculum & instruction
- School improvement efforts are organized with temporary, ad hoc arrangements that lose steam as the innovation loses lustre
- Many educators have a maintenance orientation due to the belief that problems of achievement are student and home characteristics rather than problems of curriculum and instruction
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WEEK 9

For the next three weeks you will be examining 15 professional development models offered by Loucks-Horsley, Hewson, Love, & Stiles. After reviewing these models you will develop an analysis of each model and identify the cell or cells from your matrix developed for objectives 1 & 2 that are most compatible with each model.

Questions to ponder as you dialogue with Loucks-Horsley, Love, Stiles, Mundry, & Hewson in *Designing Professional Development for Teachers of Science and mathematics* (Chapter 2), *Knowledge and Beliefs Supporting Effective Professional Development*

Comment: Ideas presented in this chapter correspond and may overlap with ideas you have already reviewed from chapters 3 and 4 of Joyce and Showers, but the perspective is different and worth a quick read.

- What do these authors see as the five important issues of learning and learners? (pages 33 - 37) *Ans. 1. Learners hold diverse perspectives on mathematical ideas and natural phenomena that influence how they think; 2. Learners construct new knowledge for themselves; 3. The construction of knowledge includes addition, creation, modification, refinement, restructuring and rejection; 4. Learners' new knowledge begins with widely diverse background experiences; 5. All students are capable of learning mathematics and science.*

- The authors content there are 3 guiding principles about what is known about teachers and teaching. What are these principles? (pages 38 - 42) *Ans. 1. The purpose of teaching is to facilitate learning; 2. Teachers are professionals with specialized knowledge; 3. The practice of teaching is complex.*

- What contrasting perspectives exist about the nature of mathematics and science? (pages 42 - 43) *Ans. One view is that mathematics and science are bodies of ideas that are true and have been known a long time. Another view is that mathematics and science are human pursuits as much invention as discovery with schools of thought that compete and may never be settled.*

- How do you explain what mathematics and science is about? (pages 42 - 43) *Ans. Mathematics is the science of patterns and relationships. It is not constrained to explaining the natural world. Conversely, science attempts to build a picture of the real world in terms of concepts, principles.*
theories that can be used to explain what has been observed and predict what has not.

- What is the definition of professional development in terms of its defining attributes? (pages 43 - 48) Ans. NOTE: These attributes are my interpretation of what the authors are saying here. Professional development is a process that: 1. fosters collegiality and collaboration; 2. promotes experimentation and risk taking; 3. draws content from available knowledge bases; 4. involves participants in decisions about pd program as possible; 5. provides time to participate, to reflect on, and to practice what is learned; 6. provides leadership and support; 7. supplies appropriate rewards and incentives; 8. have designs that reflect knowledge bases on learning and change; 9. integrates individual, school, and district goals; 10. and integrates both organizationally and instructionally with other professional development and change efforts.

- What 7 principles are noted by the authors for effective pd experiences? (page 44- 47) Ans. – 1. pd experiences are based on a well defined image of effective classroom learning and teaching; 2. pd experiences provide opportunities for teachers to build their knowledge and skills; 3. effective pd experiences model with teachers the strategies that will be used with their students; 4. build a learning community; 5. support teachers in serving leadership roles; 6. provide links to other parts of education system; 7. pd experiences are continually assessing themselves and making improvements.

- What principles on change guide pd experiences? (page 48 – 51) Ans. 1. change is a process that takes time; 2. individuals’ needs begin to change as they experience the process of change in their organization; 3. organizational change needs to be clearly defined, and supported by leaders who support the change; 4. most organizations resist change; 5. organizations that are continuously improving have processes for setting goals, taking actions, assessing results, and making adjustments; 6. change requires people to communicate in complex organizations about complex topics.

WEEK 10

Questions to ponder as you dialogue with Loucks-Horsley, Love, Stiles, Mundry, & Hewson in Designing Professional Development for Teachers of Science and mathematics (Chapter 5), Strategies for Professional Learning

Comment: Eighteen (18) strategies for professional development experiences are provided in this extensive chapter beginning with “curriculum alignment and instructional materials selection” and concluding with “Workshops, Institutes, Courses, and Seminars.” Each strategy is described in this chapter in terms of its underlying assumptions; key elements of the strategy, implementation requirements (time, facilities, materials, additional staff),
examples of the strategy being implemented, commentary about the strategy’s implementation and concluding by naming the cell or cells in the nomothetic-ideographic matrix developed for objective 1 that the strategy best fulfills. These elements will form the basis for an analysis of each strategy that you will develop to satisfy objective 3. Your task over the next two weeks will be to analyze each of the 18 strategies. These 18 analyses are due at the end of week 11.

As the strategy is analyzed it is important to begin with the purpose served by the strategy. The purposes of these strategies are presented in bulleted statements (pages 114 – 115). These different purposes (awareness, knowledge, translating knowledge into practice, practicing teaching to refine skills, and reflecting) are roughly the purposes noted by Joyce and Showers in chapter 5 (awareness/knowledge, positive changes in attitudes, skill development, transfer of training and executive control).

WEEK 11

**Deliverable:** Analyses of the 18 Professional Development Strategies offered by Loucks-Horsley, Love, Stiles, Mundry, & Hewson in chapter 5.

**Directions:** Complete the following steps for each Professional Development Strategy listed in Table 5.1

**STEP 1:** Describe the pd strategy in 1 to 2 sentences. NOTE: The authors provide this information immediately following the introductory case study of the strategy.

**STEP 2:** Identify the goal/purpose of the pd strategy in 1 to 2 sentences. NOTE: The authors provide this information immediately following the introductory case study of the strategy.

**STEP 3:** Present briefly the underlying assumptions of the pd strategy.

**STEP 4:** Present key elements of the pd strategy’s implementation requirements (e.g., time, facilities, materials, additional staff).

**STEP 5:** Present implementation requirements in one to two sentence per requirement.

**STEP 6:** Very briefly present commentary about the strategy’s implementation.

**STEP 7:** Conclude this analysis by identifying the cell or cells in the nomothetic-ideographic matrix developed for objective 1 that the strategy best fulfills.
An analysis for **Immersion in Inquiry Into Science or Mathematics** has been completed to illustrate how the seven step process may appear for each pd strategy.

**Analysis of Immersion in Inquiry in Science and Problem Solving in Mathematics**

**Description:** This strategy provides opportunities for teachers to experience first-hand science or mathematics content and processes that will be taught to their students through inquiry processes.

**Goal(s)/purpose(s):** To enable teachers to become competent in their content and reflective about how best to teach it.

**Underlying Assumption(s):** 1) Science and mathematics comprise processes and content domains consisting of ways of knowing (inquiry processes) and concepts, principles, models, theories of the discipline. 2) Teachers benefit from experiencing new instructional approaches they are expected to implement with their students. 3) Teachers must have an in-depth understanding of science and mathematics content and processes.

**Key Elements:** 1) Intensive experience where teachers focus on learning content as well as the processes for learning the content. 2) Focus of the activities of this pd strategy is on how students learn through inquiry-based activities. 3) Emphases are placed on changing teacher conceptions about content discipline and teaching strategies associated with new understanding of discipline.

**Implementation Requirements:** 1) Qualified instructors who can guide teachers to new understandings of the inquiry process and content. 2) Long-term experiences harking back to Joyce and Shower’s recommendation that 20 – 25 trials over a period of 8 to 10 weeks are necessary to bring a teaching model of medium complexity under the teacher’s control.

**Commentary:** This strategy is time-intensive and may not work for teachers under severe time constraints. Second, this approach usually works best in initiating teachers into a new view of science (i.e., teachers with little or no background in content domain). Third, this strategy needs to directly connect teacher learning of science and mathematics to what is taught in the classroom.

**Optimal Strategy for Nomothetic-Ideographic Matrix:** Cells 7, 11 and 15 are likely candidates for this strategy with Cell 7 being the most likely organizational description where this strategy would be a potentially ideal
choice. As you recall, the ideographic goal of competence and nomothetic
goal of adaptation are central organizing concepts for Cell 7.

WEEK 12
Over the next two weeks you will be examining context issues that influence
professional development programs as well as a professional development
effort that I have been heavily invested in over the past five years. These
readings should provide background information to you in developing your
final deliverable for this course, a professional development framework for a
pd program.

Questions to ponder as you dialogue with Loucks-Horsley, Love, Stiles,
Mundry, & Hewson in Designing Professional Development for Teachers
of Science and mathematics (Chapter 3), Context Factors Influencing
Professional Development

Comment: There are numerous contextual factors that influence the
development and implementation of professional development programs.
This chapter addresses these factors with a cluster of questions to guide pd
developers as they begin their development process. Please examine these
questions in the chapter since only a few of the items are presented in this
detailed schedule.

Students, Standards, and Learning Results: Supporting the position of
Joyce and Showers, these authors emphasize the goal of professional
development is improving student learning, although students are not the
primary clients of professional development. A logical starting point in pd
program development is gaining a perspective of the students by conducting a
needs scan to answer questions such as: 1) How are your students doing in
accomplishing local, state and national frameworks/standards for mathematics
and/or science? 2) What results for learning mathematics and science are
most important to your system? 3) What are the norms for students in the
classroom?

Teachers and Teachers’ Learning Needs: Teachers are the primary clients
of pd efforts, yet it is not unusual for pd developers to begin their planning
without knowing their clients. What are the “downsides” of not performing
due diligence information gathering on teacher clients? (page 58) Ans. –
insulting and alienating teachers because the pd program does not honor the
knowledge, skill, cultures and experience of the participating teachers.

The grade level taught by the teacher may indicate what about the background
knowledge and skills of the teachers? Ans. – Generally elementary level
teachers have less background in the content discipline than high school
teachers, while elementary teachers may understand child development and
curriculum integration better than their high school colleagues because of
their experience using a wide range of activities that require knowledge and skills about accounting for the development of the learner and integration of what they are teaching across the school’s curriculum.

See needs scan questions (pages 59 – 60) that may help to understand the client teachers. Examples include: 1. Who are the teachers? How well prepared are teachers to teach challenging science and mathematics content? What goals do teachers have for their learning?

**Curriculum, Instruction, Assessment Practices and the Learning Environment:** If the classroom practice is to be transformed, what pedagogical concepts must be examined by pd developers? (page 61) *Ans.* – curriculum (what is being taught), instruction (how it is being taught), assessment (how learning is measured), and learning environment (the physical facilities and arrangements as well as the culture within the classroom).

See needs scan questions (pages 63 - 64) that should be assessed as inputs before designing pd programs. Examples include: 1. To what extent is the curriculum focused, rigorous and coherent? 2. To what extent are students in science classes involved in active, hands-on activities? 3. How do teachers assess learning over time? 4. Are teachers and students respectful of one another?

**Organizational Culture:** How does the school’s culture affect professional development? (page 62) *Ans.* – short answer is that culture shapes behavior within an organization, and dramatically influences the change process. Reflect on the Hord and Boyd quote.

See needs scan questions (page 66) to assess organizational culture inputs before designing pd programs. Examples include: 1. Do teachers and staff meet and work together to solve instructional and curricular issues? 2. Do people enjoy working together, support one another and feel included? 3. Are people in this school because they want to be?

**Organizational Structures and Leadership** attributes include: the decision-making positions and groups that are in place, procedures for decision-making, the quality of leadership, assignment of people, and scheduling of time are attributes of an organization’s leadership structure.

Who are the “right people” to have at the table in making pd decisions? (page 67) *Ans.* – individuals who are relevant (folks most affected by the pd decisions), have expertise, and jurisdiction (have authority to carry out decisions).
Comment: I came across this quote as this section of the syllabus was being developed. It seems to capture the essence of leadership and organizational structure.

LEADERSHIP

A leader is one who
knows the way,
goes the way,
and shows the way. – John C. Maxwell

What are the qualities of an effective leader of professional development efforts? (page 68) Ans. – these individuals articulate clear expectations, outcomes, and purposes of the program; link pd goals to other important organizational goals and initiatives; model continuous learning themselves; delegate development responsibilities; and focus the effort.

What professional development supports do effective leaders have under their control? (page 68) Ans. – freeing up time for participating teachers; being able to actively participate in the pd effort; and encouraging risk-taking in the classroom.

See needs scan questions (pages 70 - 71) to assess organizational structure inputs before designing pd programs. Examples include: 1. To what extent are teachers at the district and building levels provided clear directions for pd? 2. Who in the organization makes decisions about professional development? 3. What pd efforts are currently underway in the organization?

National, State and Local Policies: Often professional development is not acknowledged as a legitimate activity for teachers because policies and practices reflect that teachers are only doing their job when they are in the classroom teaching. When pd programs are legitimized they are often viewed as programs to correct deficits rather than the ongoing professional enhancement of practices. See scan questions (page 72) to understand the impact of extant policies on pd program design. Examples include: 1. What policies impact pd at the local, state, and national levels? 2. Are salary increases tied to professional development or the taking on of new roles? 3. How do policies enhance or impede collegial activities such as, mentoring, peer coaching for teachers to actively collaborate on developing new knowledge/skills?

Available Resources: More often than not, time, money, and materials (including equipment) are scarce and limit the scope and depth of pd programs. Long-term, sustained, “results-driven” and “job-embedded” approaches to pd require even greater demands on dollars and time than traditional practice has allocated to pd efforts. A beginning point in taking
stock of available resources can be determined by the following scan questions (page 74): 1. How much time is provided in pd programs for teachers? 2. What grant funds are available? 3. What resources (credit reimbursements, teacher evaluation) are provided in the pd budget that could be re-directed?

**History of Professional Development:** Teachers' past experience with pd efforts will influence how they view new initiatives. If teachers have been “in-serviced to death” they likely need to experience very different pd strategies.

See needs scan questions (page 76) to assess prior pd experiences of teachers before designing pd programs. Examples include: 1. What have teachers' experiences been with professional development? 2. What has been tried and abandoned and why?

**Parents and the Community:** Consider who your supporters are in the community and plan for their involvement. Fear and mistrust of the public can hamper pd efforts because of apprehension about change and the lack of understanding of what the school’s programs are trying to accomplish.

See needs scan questions (page 78) to assess community and parental involvement by teachers before designing pd programs. Examples include: 1. What are parents’ and community supporters’ interests and issues about the science and mathematics programs you provide? 2. Do parents and community members understand why changes in teaching are needed and are they supportive of policies and structures needed to support effective pd programs? 3. Where in the community can you find support for mathematics and science reform and use this support as a resource for pd?

**WEEK 13**

A paper is provided for your review that describes a pd effort recently completed by eEducation Group staff (this group includes J. Denton). I think there are some ideas in this paper that potentially may influence your professional development framework.


What needs sensing activities did the eEducation Group engage in to demonstrate a need for this project? (pages 4 – 5) Ans. – ... a needs sensing activity was conducted with all public and private teacher education
programs at institutions of higher education in Texas. ... A second survey was completed to determine the changes in Texas public schools regarding technology infrastructure.

What needs were identified from these efforts? [These needs actually became the project goals and were phrased as research questions in this paper] (page 8) Ans. – Using the findings from these surveys, the research team identified the following needs to be addressed by this project:

- Development of faculty in the College of Education to be proficient in the use of various instructional and communication technologies;
- Development of capacity within the College of Education in digital media that supports the National Council for the Accreditation of Teacher Education (NCATE) standards and the International Society for Technology in Education (ISTE);
- Development of support to faculty transitioning to new teacher preparation programs by supporting their technology infusion efforts into the curricula.

What theoretical perspectives were presented to support this project? (pages 9 – 12) Ans. – First brief remarks were offered about the net generation cohort being very comfortable with technology and willing to help their elders in gaining proficiency with technology tools. Second, a national survey of technology infrastructure in the nation’s schools was highlighted to show that our needs scan findings about infrastructure were very consistent with what is occurring nationally. Third, perspectives about what teachers, the intended target for the professional development, would likely bring to the project. And finally, perspectives are offered about the expectations of school administrators and the kinds of support that would facilitate the project being successful.

What procedures were used to develop and implement this pd effort for technology infusion? NOTE: The “procedures” section of this paper translates to a description of instructional program experiences that you are expected to provide in your professional development framework. (pages 12 – 17) Ans. – processes for the following pd program components are addressed: 1. recruitment of teacher education faculty and technology fellows; 2. faculty orientation to project and technology mentor training; 3. continuing professional development of technology fellows.

What formative and summative evaluation processes are presented in this paper? (pages 17 – 23) Ans. – The information for the formative evaluation processes and findings are presented under the “data collection” section of the paper, and the summative evaluation findings are presented under the “findings and interpretations” sections of the paper. Briefly, a digital management system was developed and applied to collect and organize artifacts produced by teachers and mentors during the project. Some of these
artifacts were used in developing on-line courses or course components. Annual perception data were collected from participants to determine the value of the pd effort and compared across years of the project. These data were used to determine program components that needed adjustment. The summative aspect of this project was to determine whether the goals of the pd effort were met. As presented under findings and interpretations, we felt we succeeded in meeting the goals of the program.

What is the schedule of events/experiences for the entire program? Ans. – although a detailed schedule across the 3 year program was developed and presented in the application for funding, this schedule was not included in this paper about the program. The description of events associated with faculty orientation and technology mentor training (pages 14 – 16) does represent a calendar of events that were repeated across the program.

WEEKS 14

EXAMPLES: Two proposals developed and submitted for funding to federal agencies by Jon Denton over the past three years are provide to illustrate components needed for professional development proposals for school organizations.

The following proposals were developed as professional development programs. The components in each proposal were phrased to specifically address requirements stated in the Request-For-Applications (RFAs). Proposal 1 is a double-spaced 50 page document as suggested in the RFA, while Proposal 2 is a single-spaced plan of 10 pages. Both proposals were submitted electronically following particular protocols specified by the funding agencies.

NOTE: Rather then present guiding questions, I have identified the sections in these proposals that address the components for your final deliverable related to objective 4.

Proposal 1: An On-line Alternative Certification Program at Texas A&M University

- Need for the professional development program and theoretical rationale (citing sources) that clearly address nomothetic and ideographic perspectives for the science department [Need for the project: pages 1-7]
- Delineating objectives for the professional development program [Project Objectives: pages 8–12];
- Description of instructional program experiences [Quality of Project Services: pages 18–34];
• Formative and summative evaluation protocols [Quality of Project Evaluation: pages 42 – 50]; and
• Schedule of events/experiences for the entire program [Quality of Management Plan: pages 41 – 42].

Proposal 2: Online NSBRI Instructional Resources Offered in Undergraduate and Graduate Science Education

• Need for the professional development program and theoretical rationale (citing sources) that clearly address nomothetic and ideographic perspectives for the science department – [Motivating Rationale: pages 1 – 2]
• Delineating objectives for the professional development program [Goals & Objectives: pages 2 – 3]
• Description of instructional program experiences [Methods: pages 3 – 7]
• Formative and summative evaluation protocols [Evaluation Plan: pages 9 –10]
• Schedule of events/experiences for the entire program [Timeline: pages 7 – 9].

Deliverable for Objective 4: Develop a professional development framework (proposal) for a professional development program in your science department that will foster greater student achievement on the Texas Assessment of Knowledge & Skills in Science.

Components of Proposal: This proposal will take the form of a 10 -15 page paper (font size 12, font style: Times) that includes:
• Need for the professional development program and theoretical rationale (citing sources) that clearly address nomothetic and ideographic perspectives for the science department;
• Delineating objectives for the professional development program;
• Description of instructional program experiences;
• Formative and summative evaluation protocols; and
• Schedule of events/experiences for the entire program

This plan will be submitted electronically using Microsoft word processing software.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of [College of Engineering]

2. Course prefix, number and complete title: **ENGR 698 Writing for Publication**

3. Course description (not more than 50 words): Writing in academic disciplines and settings. Writing for different audiences and purposes. Style; planning and development of academic journal articles; grant proposals; correspondence; oral presentations; technical reports. Permission of departmental/college graduate advisor.

4. Prerequisite(s): advanced standing in master's/doctoral programs. Cross-listed with [Insert cross-listed course information].

5. Is this a variable credit course? ☐ Yes ☐ No. If yes, from _____ to _______.

6. Is this a repeatable course? ☐ Yes ☐ No. If yes, this course may be taken _____ times. Will the course be repeated within the same semester/term? ☐ Yes ☐ No.

7. Has this course been taught as a 489/689? ☐ Yes ☐ No. If yes, how many times? _____ Indicate the number of students enrolled for each academic period it was taught. 25

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
      any master's or doctoral program

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix | Course # | Title (exclude punctuation) | Lect. | Lab | SCH | Subject Matter Content Code | Admin. Unit | Acad. Year | FICE Code | Level |
      ENGR | 698 | WRITING FOR PUBLICATION | 0 | 3 | 0 | 0 | 3 | 1 | 4 | 0 | 1 | 0 | 1 | 0 | 0 | 6 | 0 | 9 | 6 | 5 | 0 | 7 | 0 | 8 | 0 | 0 | 3 | 6 | 3 | 2 |

Do not complete shaded area.

Approval recommended by:
\[Signature\] 4/18/07
Head of Department

Chair, College Review Committee
\[Signature\] 4/18/07

Dean of College
\[Signature\] 4/18/07

Submitted to Coordinating Board by:

\[Signature\] Date
Director of Academic Support Services

\[Signature\] Date
Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
OAR/AS-5/04

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ENGR 698: Writing for Publication

Instructor:

Elizabeth Tebeaux
Professor of English
243E Blocker

Phone: 862-3593
Email: e-tebeaux@tamu.edu
Office hours: TBA

Resource website: http://www.tamu.edu/ode/graduatewritingproject
Reading assignments are located on this URL and in the required texts.

Enrollment Prerequisites

The course targets graduate students working on their theses or dissertations and/or students actively planning and writing an article for publication. Students beginning their graduate work should not enroll because of the level of writing projects required. Students who enroll should be focusing on completing their academic work and committed to improving their writing. This course is NOT about grades but having focused time to learn how to improve your writing.

Course Objectives

- Practice elements of communication needed by graduate students in an academic work context.
- Apply principles of design as these apply to sentences, paragraphs, and complete documents.
- Practice developing types of academic writing.
- Review principles of usage and punctuation—essentials of Standard English.
- Develop expertise in writing needed beyond school. Students who enroll are encouraged to focus on an article they may wish to publish or their thesis or dissertation.

Outcomes

- Students will prepare a variety of documents related to their graduate work and writing in the workplace.
- These documents will allow students to practice application of development principles needed for each kind of document.
- Students will improve their command and application of principles of writing as determined by pre-/post-assessment.

Course Description

3 SCH credit. Class sessions will have discussion, lecture, and practice time for students to work on writing projects. Course will focus on principles for developing sentences, paragraphs, scientific papers and presentations. Other topics: understanding the elements of clarity, developing grant proposals, avoiding plagiarism, understanding the perspectives of journal editors, developing effective oral presentations and PowerPoint slides, developing the CV. Students will work in teams to discuss/evaluate some assignments. Students will complete a writing assessment assignment at the beginning and the end of the course to determine improvement. Design of subsequent sections of this course will use assessment results. Course topics/assignments may vary depending on needs of the individual class.
Course Assignments – will vary with needs of each class

Writing assessment assignment—beginning and end of the term

Analysis of journal publication requirements—memorandum

Effective paragraph development
  □ Short paragraph abstracts based on short articles
  □ Revisions of two of your paragraphs.

Introduction-- for an article or for your thesis/dissertation
Abstracts—descriptive and informative of an article
Developing effective correspondence
  □ Query letter to an editor of a journal
  □ Proposal letter (for an article or a presentation)

Two articles:
  □ Article for publication; or short article summarizing your research findings
  □ Revision of this article for a general audience.

Effective conference presentations

Review of grammar and usage as needed; in-class practice; avoiding plagiarism

Course Requirements

  • Attend class regularly. Complete all assigned readings. Participate in team assignments. Ask questions. Do all assignments. All assignments must be submitted to pass the course.

Evaluation

  • Each assignment will be evaluated according to the development principles for each document assigned.
  • Evaluations will use rubric to evaluate how well students understand principles of planning, writing, revising, and editing. Grading for the course will be pass/fail.

Academic Integrity

  Aggies do not lie, cheat, or steal or tolerate those who do.

Each student is expected to do his/her own work. This course is NOT about grades but about learning how to plan, write, and revise documents important in an academic environment. Any violation of the honor code will be reported to the Honor Code Office and to the Office of Graduate Studies.

Required Books (Available at the university book store under Graduate Writing Project)
These books should be useful to you long after you have completed this course.
Course and Assignment Sequence

- Knowing what your field expects/requires in terms of style and presentation.
- Writing an effective thesis/dissertation:
- Effective paragraphing, clear sentence structure, document design, and concepts of organization
- Documentation: How to avoid plagiarism. Speaker: Candace Shafer, University Writing Center
- Presentation by two journal editors—Writing requirements for article acceptance
- Effective writing and proposal acceptance—Dr. Phyllis McBride. Office of Proposal Development, VPR

Assignment 1: Summarize your discipline's guide to publication. Focus on writing and style requirements for articles. Or, assess a journal in which you would like to publish. Describe kinds of articles published, focus of articles, targeted readers, length, format, sentence style, documentation, visuals, abstract type used. Prepare a memo reporting your findings. Attach several pages of an article from this journal.

Analyzing Audiences: What do academic editors of journals expect in articles submitted for publication? Speakers: two editors from professional/academic journals currently housed at TAMU.

Principles of Design for technical reports, articles, proposals, and correspondence

Analyzing Paragraph Development

Assignment 2: Submit two paragraphs you have written along with revisions of these paragraphs based on the elements of good paragraphs.

Developing Abstracts: Discussion of different types of abstracts—form and content

Assignment 3: Write a one-paragraph informative abstract of the article on the website (assignment readings). Write a short descriptive abstract of the same article.

Developing Introductions: Analyze introductions of articles in journals in which you would like to publish. Analyze introductions to theses and dissertations.
Assignment 4: Prepare an introduction to an article. Or, work on the introduction to your thesis/dissertation.

- Review of Sentence Structure: How to write a clear, concise sentence. Sentence/paragraph construction will be studied regularly.
  
  Short essay to study and edit. Goal: improve readability and clarity. In-class project.

- Review of punctuation, usage, and grammar—will occur regularly, as needed. Focus: problems that occur in students’ papers.

- Designing Effective Memoranda and Letters
  
  Assignment 5: Memoranda/letters written in response to case situations. Write a letter of inquiry to a journal editor.

- Designing Proposals—Dr. Phyllis McBride, Office of Proposal Development, VPR
  
  Assignment 6: Prepare a proposal for an article or a conference presentation. Scenario: A colleague in your discipline is planning a special issue on a topic. Graduate students are invited to submit one/two-page proposals for articles/presentations. Write the proposal and attach it to a letter to the person who is soliciting proposals for the special issue/conference.

- Planning/writing the academic article and the popular article
  
  - Assignments 7A: Write an article about a topic in your field of research. Article 7B: Target audience: general readers. Goal: Learn to explain your research to non-technical readers.

- How to read an article at a conference; effective use of PowerPoint.

- Developing the effective CV and application letter.

Americans with Disabilities Act (ADA) Policy Statement

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Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of ______________.
   
2. Course prefix, number and complete title ________________
   
3. Course description (not more than 50 words) ________________
   This course will present an in-depth analysis of multifunctional materials and composites, and their novel applications.
   
4. Prerequisite(s) ________________
   Cross-listed with ________________
   Cross-listed courses require the signatures of both department heads.
   
5. Is this a variable credit course? ☐ Yes ☒ No   If yes, from _______ to _______.
   
6. Is this a repeatable course? ☐ Yes ☐ No   If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? ☐ Yes ☐ No
   
7. Has this course been taught as a 489/689? ☐ Yes ☐ No   If yes, how many times? _____ Indicate the number of students enrolled for each academic period it was taught. 05/10 (MEMA/AERO/MSEN)
   
8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   M.S., Ph.D. in Aerospace, Mechanical, Materials Science Engineering

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix ________________ Course # ________________ Title (exclude punctuation) ________________

    MEMA 606 MULTIFUNCTIONAL MATERIALS

    Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
    0 2 0 1 0 3 1 4 0 2 0 1 0 0 6 0 1 0 0 7 - 0 8 0 0 3 6 3 2
    Do not complete shaded area.

Approval recommended by:

Head of Department ________________ Date ________________

Head of Department (if cross-listed course) ________________ Date ________________

Chair, College Review Committee ________________ Date

Dean of College ________________ Date

Submitted to Coordinating Board by:

Director of Academic Support Services ________________ Date ________________

Effective Date ________________

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OAR/AS-5/04

65 of 82 C
AERO 606: Multifunctional Materials
Crosslisted as MEMA 606 / MSEN 606

Course Description
- Semester course, 2 lecture hours, 1 lab hour, 3 credits

The course will present an in-depth analysis of multifunctional materials and composites, and their novel applications. Multifunctionality is a term generally used to describe the ability of certain materials to integrate structural utility with other non-structural functionality, such as sensing/actuation or self-healing. Biological materials are inherently multifunctional in that they have a hierarchical structural organization and a coupling between structure and function that combines a range of capabilities, to save weight and volume (e.g., wood and bone). They are the inspiration for emerging synthetic multifunctional materials and systems.

Topics covered will include processing, characterization and constitutive modeling of multifunctional materials. Materials such as electroactive polymers; piezoelectric, magnetostrictive, and shape memory materials and nanostructured polymer composites will be considered. The constitutive behavior of multifunctional materials will be covered both from a theoretical and an experimental perspective. Applications to actuators, nanostructured composites and smart structures will be discussed. Other materials and applications will be introduced through course projects.

Course Objectives
The overall course objective is to provide students with a comprehensive look into the state of the art in multifunctional materials and structures.

- Introduce multifunctionality as exhibited by synthetic materials and biological material systems.
- Demonstrate how resulting properties in multifunctional materials are related to molecular and atomic level mechanisms that translate into useful macroscopic properties.
- Establish principles for deriving multifunctional constitutive response, emphasizing scale transitions.
- Use characterization tools for multifunctionality.

Course Content
1. Introduction to multifunctional materials and their applications:
   a. Biological materials exhibiting multifunctionality (e.g. bone, marine organisms, etc.)
   b. Bioinspired synthetic materials
   c. Aerospace, medical and MEMS applications
2. Coupled fields in multifunctional materials; constitutive relations.
   a. Microscale mechanisms
   b. Constitutive models for macroscale representation of response
3. Classes of multifunctional materials
   a. Electroactive polymers and composites.
   b. Nanostructured and nanoreinforced polymers
   c. Carbon nanotube and carbon nanotube-based composites
   d. Magnetoactive materials.
   e. Shape and magnetic shape memory alloys.
a. Lab familiarity with applicable characterization such as microscopy, mechanical, magnetic and electrical characterization.

b. Mechanical, thermal, electrical and magnetic response

c. Sensing and actuation performance

5. Multifunctionality at different length scales – from nano to macro.
   a. Difference between bulk and nanoscale properties will be presented
   b. Coupling between nanoscale properties and macroscale performance

6. Applications in design of multifunctional structures.

Course Outline with Approximate Times Assigned to Each

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</tr>
<tr>
<td>7. Project/lab</td>
<td>10</td>
</tr>
<tr>
<td>8. Midterm</td>
<td>2</td>
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</tbody>
</table>

Total 45

Course Materials

Course materials consist of lecture notes and articles from the current literature.

Prerequisites / Co-requisites

Theory of Elasticity (MEMA 601) or Continuum Mechanics (MEMA 602 / AERO 603)
MSEN 601 or MEMA 609

Grading

Homework, labs, quizzes 35%; Midterm 30%; Project 35%.

Instructors

Dr. Zoubeida Ounaies, Department of Aerospace Engineering
HRBB 744C; phone: 458-1330; e-mail: zounaies@aero.tamu.edu

Americans with Disabilities Act

The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 8118 Cain Hall, or call 845-1637.

Copyrights

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Scholastic Integrity

As commonly defined, plagiarism consists of passing off as one's own the ideas, work, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules [http://student-rules.tamu.edu/], under the section “Scholastic Dishonesty.”
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 25 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of Aerospace Engineering

2. Course prefix, number and complete title AERO 608 (MEMA 608) MSEN 608 - Nanomechanics

3. Course description (not more than 50 words) Application of mechanics concepts to nano-scale behavior of materials. Review of continuum mechanics; Extensions to generalized continua; Nonlocal elasticity; Nano-scale plasticity. Focus on multi-scale modeling; Dislocation Dynamics; Quasi-Continuum method; Molecular dynamics with introductions to quantum mechanics and statistical mechanics.

4. Prerequisite(s) AERO 603, MEMA 601

5. Is this a variable credit course? ☐ Yes ☐ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☐ No If yes, this course may be taken ___ times. Will the course be repeated within the same semester/term? ☐ Yes ☐ No

7. Has this course been taught as a 489/689? ☐ Yes ☐ No If yes, how many times? ___ Indicate the number of students enrolled for each academic period it was taught. ___ in Fall 2004, ___ in Fall 2006

8. This course will be:
a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

M.S. and Ph.D. programs in Aerospace Engineering, Mechanical Engineering, Materials Science Engineering

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation)

MEMA 608 NANO MECHANICS

Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
03 00 03 14 02 01 00 06 01 00 07 00 01 03 36 6

Level

Approval recommended by:

Head of Department

Head of Department (if cross-listed course)

Submitted to Coordinating Board by:

Director of Academic Support Services

* Attach a syllabus according to the guidelines on the Internet site www.tamu.edu/admissions/oaras. To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OARAS-1099

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AERO/MEMA/MSEN 608 Nanomechanics
Credit 3: (3-0)

Instructor: A.A. Benzeraga  Office: 736C H.R. Bright Building  Tel: 845-1602
Office Hours: Monday and Wednesday from 5 to 6 pm  E-mail: benzeraga@aero.tamu.edu

Course Description: This two-part course adopts a top-down approach to nanomechanics. The first part (continuum nanomechanics) is based on advanced elasticity and diffusion concepts to motivate topics such as nanoindentation and self-assembly. The second part (discrete methods in nanomechanics) is focused on multi-scale computational methods. The course integrates concepts from continuum mechanics, solid state physics and atomistics.

Prerequisites: AERO 603 or MEMA 601

Course Text: There is no required text for this class. Notes and copies will be occasionally handed-out to motivate certain topics.

Course Evaluation:
Homeworks and quizzes 35%
Project 30%
Paper Review 15%
Final Exam 20%

Course Topics

1. Continuum Nanomechanics  (Total 22)
   (a) Elasticity and diffusion equations  3
   (b) Basic results from elasticity (point forces, crystal defects)  3
   (d) Theory of patterning and self-organization  3
   (e) Nonlocal elasticity: connections to physics  3
   (f) Nanomechanics of defects in nanorods and nanotubes  4
   (g) Microstructure evolution  *  3

2. Discrete Methods in Nanomechanics  (Total 20)
   (a) Discrete dislocation plasticity**  8
   (b) Elements of quantum mechanics  3
   (c) Introduction to molecular dynamics simulations  6
   (d) Coupled atomistic/continuum methods  3

* includes 30-50% of laboratory instruction and constitutes basic material for some projects.
** includes one session at the Immersive Visualization Center (IVC; http://ivc.tamu.edu) and constitutes basic material for some projects.
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Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

1. This request is submitted by the Department of [Aerospace Engineering]

2. Course prefix, number and complete title [AERO 606/MEMA 608/MSEN 606] Multifunctional Materials

3. Course description (not more than 50 words) This course will present an in-depth analysis of multifunctional materials and composites, and their novel applications.

Prerequisites: Theory of elasticity or Continuum Mechanics

4. Prerequisite(s) MEMA 601 or MEMA 602 / AERO 603, MSEN 601 or MEMA 609 Cross-listed with AERO 606/MSEN 606/MEMA 609

5. Is this a variable credit course? ☐ Yes ☐ No If yes, from ______ to ______.

6. Is this a repeatable course? ☐ Yes ☐ No If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? ☐ Yes ☐ No

7. Has this course been taught as a 489/689? ☐ Yes ☐ No If yes, how many times? ______ Indicate the number of students enrolled for each academic period it was taught: GSC 10 (MEMA/AERO/MSEN)

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

M.S., Ph.D. in Aerospace, Mechanical, Materials Science Engineering

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation) MSN 606 MULTIFUNCTIONAL MATERIALS

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Level

Approval recommended by: [Signature] 3-27-07

Head of Department [Signature] Date Chair, College Review Committee [Signature] Date

Head of Department (if cross-listed course) [Signature] Date Dean of College [Signature] Date

Submitted to Coordinating Board by:

Director of Academic Support Services Date Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.

OAR/AS-5/04

71 of 82 C
AERO 606: Multifunctional Materials  
Crosslisted as MEMA 606 / MSEN 606

Course Description
- Semester course, 2 lecture hours, 1 lab hour, 3 credits

The course will present an in-depth analysis of multifunctional materials and composites, and their novel applications. Multifunctionality is a term generally used to describe the ability of certain materials to integrate structural utility with other non-structural functionality, such as sensing/actuation or self-healing. Biological materials are inherently multifunctional in that they have a hierarchical structural organization and a coupling between structure and function that combines a range of capabilities, to save weight and volume (e.g., wood and bone). They are the inspiration for emerging synthetic multifunctional materials and systems.

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Course Objectives
The overall course objective is to provide students with a comprehensive look into the state of the art in multifunctional materials and structures.

- Introduce multifunctionality as exhibited by synthetic materials and biological material systems.
- Demonstrate how resulting properties in multifunctional materials are related to molecular and atomic level mechanisms that translate into useful macroscopic properties.
- Establish principles for deriving multifunctional constitutive response, emphasizing scale transitions.
- Use characterization tools for multifunctionality.

Course Content
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   b. Bioinspired synthetic materials
   c. Aerospace, medical and MEMS applications

2. Coupled fields in multifunctional materials; constitutive relations.
   a. Microscale mechanisms
   b. Constitutive models for macroscale representation of response

3. Classes of multifunctional materials
   a. Electroactive polymers and composites.
   b. Nanostructured and nanoreinforced polymers
   c. Carbon nanotube and carbon nanotube-based composites
   d. Magnetoactive materials.
   e. Shape and magnetic shape memory alloys.

a. Lab familiarity with applicable characterization such as microscopy, mechanical, magnetic and electrical characterization.
b. Mechanical, thermal, electrical and magnetic response
c. Sensing and actuation performance
5. Multifunctionality at different length scales – from nano to macro.
   a. Difference between bulk and nanoscale properties will be presented
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Total 45

Course Materials
Course materials consist of lecture notes and articles from the current literature.

Prerequisites / Co-requisites
Theory of Elasticity (MEMA 601) or Continuum Mechanics (MEMA 602 / AERO 603)
MSEN 601 or MEMA 609

Grading
Homework, labs, quizzes 35%; Midterm 30%; Project 35%.

Instructors
Dr. Zoubeida Ounaies, Department of Aerospace Engineering
HRBB 744C; phone: 458-1330; e-mail: zounaies@aero.tamu.edu

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Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and 25 copies. Attach a course syllabus to each.*

1. This request is submitted by the Department of Aerospace Engineering

2. Course prefix, number and complete title AERO 608 / MEMA 608 / MSEN 608 Nanomechanics

3. Course description (not more than 50 words) Application of mechanics concepts to nano-scale behavior of materials. Review of continuum mechanics; Extensions to generalized continua; Nonlocal elasticity; Nano-scale plasticity. Focus on multi-scale modeling; Dislocation Dynamics; Quasi-Continuum method; Molecular dynamics with introductions to quantum mechanics and statistical mechanics.

4. Prerequisite(s) AERO 603/604, MEMA 601

5. Is this a variable credit course? □ Yes □ No If yes, from ______ to ______.

6. Is this a repeatable course? □ Yes □ No If yes, this course may be taken ______ times. Will the course be repeated within the same semester/term? □ Yes □ No

7. Has this course been taught as a 489/689? □ Yes □ No If yes, how many times? ______ Indicate the number of students enrolled for each academic period it was taught. 7 in Fall 2004, 8 in Fall 2006

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

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M.S. and Ph.D. programs in Aerospace Engineering, Mechanical Engineering, Materials Science Engineering

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10. Prefix | Course # | Title (exclude punctuation) | Lect | Lab | SCH | Subject Matter Content Code | Admin. Unit | Acad. Year | FICE Code | Level

   MSEN 608 | NANOMECHANICS | 03 | 00 | 03 | 14 | 02 | 01 | 00 | 6 | 01 | 00 | 07-08 | 0 | 1 | 0 | 3 | 6 | 6

Do not complete shaded area.

Approval recommended by:

Head of Department

Date

Chair, College Review Committee

Date

Dean of College

Date

Submitted to Coordinating Board by:

Director of Academic Support Services

Date

Effective Date

* Attach a syllabus according to the guidelines on the Internet site www.tamu.edu/admissions/oeras. To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
AERO MEMA MSEN 608 Nanomechanics
Credit 3: (3-0)

Instructor: A.A. Benzerga
Office: 736C H.R. Bright Building
Office Hours: Monday and Wednesday from 5 to 6 pm
Tel: 845-1602
E-mail: benzerga@aero.tamu.edu

Course Description: This two-part course adopts a top-down approach to nanomechanics. The first part (continuum nanomechanics) is based on advanced elasticity and diffusion concepts to motivate topics such as nanoindentation and self-assembly. The second part (discrete methods in nanomechanics) is focused on multi-scale computational methods. The course integrates concepts from continuum mechanics, solid state physics and atomistics.

Prerequisites: AERO 603 or MEMA 601

Course Text: There is no required text for this class. Notes and copies will be occasionally handed-out to motivate certain topics.

Course Evaluation:
Homeworks and quizzes: 35%
Project: 30%
Paper Review: 15%
Final Exam: 20%

Course Topics

1. Continuum Nanomechanics
   (Total 22)
   (a) Elasticity and diffusion equations 3
   (b) Basic results from elasticity (point forces, crystal defects) 3
   (d) Theories of patterning and self-organization 3
   (e) Boundary layer: connections to physics 3
   (f) Nanomechanics of defects in nanorods and nanotubes 4
   (g) Microstructure evolution * 3

2. Discrete Methods in Nanomechanics
   (Total 20)
   (a) Discrete dislocation plasticity ** 8
   (b) Elements of quantum mechanics 3
   (c) Introduction to molecular dynamics simulations 6
   (d) Coupled atomistic/continuum methods 3

* includes 30-50% of laboratory instruction and constitutes basic material for some projects.
** includes one session at the Immersive Visualization Center (IVC; http://ivc.tamu.edu) and constitutes basic material for some projects.
Americans with Disabilities Act
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 118 Cain Hall, or call 845-1637.

Scholastic Integrity
"An Aggie does not lie, cheat, or steal or tolerate those who do."
As commonly defined, plagiarism consists of passing off as one's own the ideas, work, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules [http://student-rules.tamu.edu/], under the section "Scholastic Dishonesty.

Copyrights
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Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional

1. This request is submitted by the Department of Teaching, Learning and Culture

2. Course prefix, number and complete title

3. Course description (not more than 50 words)

4. Prerequisite(s) Graduate Status

5. Is this a variable credit course? □ Yes ☐ No
   If yes, from _______ to _______

6. Is this a repeatable course? □ Yes ☐ No
   If yes, this course may be taken _______ times. Will the course be repeated within the same semester/term? □ Yes ☐ No

7. Has this course been taught as a 489/689? ☐ Yes ☐ No
   If yes, how many times? _______ Indicate the number of students enrolled for each academic period it was taught. _____ and _____

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

5. Ed. in Curriculum and Instruction with Reading Specialization

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation)

   R D N G 6 2 0 L I T E R A C Y & L A N G U A G E

   Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
   0 3 0 0 0 3 1 3 1 3 1 5 0 0 0 4 2 8 0 4 0 7 - 0 8 0 1 0 3 6 6

   Do not complete shaded area.

   Approval recommended by:

   Head of Department Date

   Head of Department (if cross-listed course) Date

   Submitted to Coordinating Board by:

   Dean of College Date

   Director of Academic Support Services Date

   Effective Date

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Texas A & M University  
College of Education  
Dept. of Teaching, Learning, and Culture  

RDNG 620: Literacy and Language  
3 Hours Credit  
Fall 2006

Instructor: R. Malatesha Joshi, Ph.D.  
Office Address: 204, Harrington  
E-Mail Address: MJOSHI@COE.TAMU.EDU  
Office Phone(s): (979) 862-8118  
Office Hours: Wednesdays 1-4 pm or by appointment

College of Education Vision: We are a community of learners engaged in multiple forms of scholarship to create a just and literate society.

College of Education Priority: Our strategic intent in 2020 will be to assist all citizens to lead productive and fulfilling lives and to participate fully in a just democracy as highly literate, effective, and physically and mentally healthy individuals.

Course Description

Orthography of different languages and its relation to literacy acquisition and failure to acquire basic literacy skills. This is a seminar course in reading, language arts, bilingual education, psychology, linguistics, and related fields.


Course Objectives

After the successful completion of the course, each student is expected to be able to apply the knowledge to understand:

a. the relationship of phonemic, morphemic, semantic, and syntactic systems of language to the acquisition of literacy;

b. the basic concepts about various writing systems such as: Alphabetic writing (English and Spanish); Morphemic writing (Chinese); Syllabic Writing (Japanese Kana and Korean Hangul); Consonantal writing (Arabic and Hebrew) and Alphabetic-syllabic system (East Asian languages like Kannada, Tamil, etc.)

c. the relationship between orthographies and the ease of literacy acquisition; and

d. the influence of first language (L1) script on the literacy acquisition in a second language (L2).
Some of the questions that we will try to answer during this course are:

1. What are the roles and interaction of decoding and comprehension skills in fluent reading?
2. According to Seymour et al., 'The establishment of an effective sight vocabulary and decoding needs about 2 years of reading experience in English as against 1-year in many European languages'. Then, is it easier to become literate in some languages than other languages? If so, why?
3. How difficult (or easy) it is to become literate in a second language? Similarly, if one has problem in acquiring literacy skills in first language, would that problem transfer to the second language also?
4. Do Chinese children perceive a word differently than English-speaking children? (In Chinese, each character or morpheme takes the same amount of space while in English it does not, as in cat vs. caterpillar)
5. English orthography is sometimes (albeit wrongly) referred to as irregular, chaotic, ... Is that the reason for high incidence of reading problems? If English orthography is made regular (if it is possible), then would we have fewer children with reading problems? Lessons from other regular orthographies.
6. What is the role of dialect in literacy acquisition?

We shall also discuss other questions that pertain to the relationship of language to literacy as they arise.

Requirements and Grade Determination

Grades will be determined by the following criteria:

**A. CLASS ATTENDANCE and CLASS PARTICIPATION** Although it is important to complete all assignments accurately and pass all examinations, the quality of the work is the most important factor. Further, the responsibility for the materials covered, assignments given, etc., during the student’s absence rests with the student. The student should make every possible effort to take all exams at the scheduled time on the scheduled date. In a similar manner, all assignments are due on the day designated. It will be necessary to discuss any exceptions to this policy, should they occur, with the instructor. Class attendance policy will conform to Student Rule #7. All your assignments should be original and prepared during the current semester.

**B. EXAMS** Mainly short answer questions based on the topics discussed. *(Midterm and a final exam) (40% of the grade)*

**C. ORAL PRESENTATION**: In this assignment, you will prepare a 20 - 30 minute oral presentation to the class on a topic related to literacy and language. Select topics from recent journal articles from refereed journals, books, chapters depending upon your needs and interests. You may want to select topics about which you like more information. **The topic must be approved in advance by the instructor.** *(30% of the grade)*
D. TERM PAPER: The paper (in APA format) should synthesize current research on a topic relating to literacy and language and should have at least 15 references from articles from refereed journals. The topic must be approved in advance by the instructor. (30% of the grade)

Grading scale will be as follows: A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; and F = below 60%.

Bibliography


Further, students should familiarize themselves with current topics by reading the following journals regularly throughout the semester:
Reading and Writing: An Interdisciplinary Journal
Applied Psycholinguistics
Journal of Psycholinguistic Research
Cognition

**Accommodation for students**

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**Academic Honesty**

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**Academic Integrity Statement:**

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**Important Dates:** August 28, First day of class; Course introduction
Sept. 18\textsuperscript{th} and December 11\textsuperscript{th} Exams
October 16-30 Oral Presentations
November 20 Term Paper due

**Class Schedule:**

August 28 and September 4:
Introduction and overview of the course
Definition of Terms and Concepts
Basic overview of literacy acquisition; Componential Model of reading
Overview of writing systems: Alphabetic, Logographic/Morphemic, Syllabic, Transparent and Opaque systems

September 11: Literacy acquisition in different orthographic systems
September 18: Exam #1
September 25: Literacy acquisition in different orthographic systems
October 2 & 9: Literacy development and literacy problems among bilinguales
October 16-30: Oral presentations and class discussions
November 6: Library work
November 13-27 Dialect, morphemes, and spelling; Instructional procedures
               Paper due (November 20)
December 11 Final Exam