Supplemental Catalog 1991-1993

- Financial Regulations
- Academic Regulations
- College of Arts and Sciences
- School of Education and Social Policy
- McCormick School of Engineering and Applied Science
- Medill School of Journalism
- School of Music
- School of Speech
- Other Undergraduate Programs
- Administration and Faculty

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Office of the Registrar, Northwestern University
Last Updated: July 1991
Replace entire University Enrollment Requirement section with:

The University Enrollment Requirement policy applies only to undergraduates in bachelor's degree programs. It does not apply to graduate students or non-degree students. This requirement must be completed in addition to the degree requirements established by the various school faculties.

All students, except for those enrolled in accelerated programs designed to be completed in fewer than four years, are expected to be enrolled for full-time study for 12 regular academic year quarters. This 12 quarter requirement is referred to as the University Enrollment Requirement (UER). Please note that the degree requirements set by the various school faculties are separate from the University Enrollment Requirement. Although some students may be able to complete their academic degree requirements, as established by the faculty, in fewer than 12 academic year quarters, such students must still fulfill the 12 quarter University Enrollment Requirement. Students who, due to circumstances beyond their control, are unable to complete the bachelor's degree requirements in 12 quarters, may petition to the University Enrollment Committee for a 13th quarter at no additional tuition charge.

For purposes of the Enrollment Requirement, full-time study is determined by the payment of full-time tuition. Students who withdraw and receive a partial refund will receive a prorated credit toward the UER based on the tuition paid. The normal full-time course load is three or four courses per quarter. However, students may, with approval of their school offices, take more than four courses per quarter without
additional charge. These excess courses may be applied toward fulfillment of degree requirements of the various schools so long as they are not used to accelerate graduation. However, for students who desire to apply the excess courses toward the UER, there will be an excess course charge for each course of 25% of the full-time quarter's tuition in effect at the time of graduation. Students wishing to apply excess courses toward the UER must indicate their desire to do so when applying for the degree. Any excess course charges will appear on the bill for the last quarter of enrollment. Financial aid recipients will not receive additional grant assistance to cover excess course charges. They may apply for additional loan assistance.

Normally, the UER will be fulfilled by 3 quarters of full-time study during each of four academic years. In addition, credits from one or a combination of the following sources may be applied toward the UER. Each course credit fulfills one-fourth of a quarter of the UER. That is, 4 course credits are required to reduce the UER by one quarter. Students who enter as freshmen with ten or more course credits will reduce their UER by one year. Regardless of the amount of credit earned outside the University, the minimum UER for all students entering as freshmen is nine quarters, which may include approved study abroad.

The approved sources of credit are:
- Advanced Placement credit through the College Board
- Placement credit awarded by Northwestern University
- Approved foreign study during the academic year.

The following credit may also be applied to the UER, subject to restriction:
- Approved Credit from another College or University

Students entering with four or more courses from another institution may not apply any additional credit from another institution towards the UER, except for approved foreign study. Students entering with fewer than four courses from another institution may apply a maximum of four courses towards the UER, including those taken before matriculation. Any courses from another institution must be completed before the achievement of senior standing. Note: courses beyond the maximum may be applied towards academic requirements, but not towards the UER.
Summer Session at Northwestern

All students may apply Northwestern Summer Session courses toward the UER. Although four courses are normally required to reduce the UER by a quarter, a three course Northwestern Summer Session load may be used to reduce the UER by one quarter. All three courses must be taken the same summer and this exception may be used only once.

Replace Returning Students section with:

Students who withdraw from the University and wish to return must submit a Returning Student Application Form to the Office of the Registrar six weeks before the desired date of reentry. Students who want credit for course work taken at another institution must submit an official transcript to the Registrar's Office. The Registrar's Office will determine the extent to which credit earned away from Northwestern may reduce the four-year UER. Students who wish to apply more than four courses taken at another institution toward the UER must petition the University Enrollment Committee.

Replace Transfer Students section with:

Students who transfer to Northwestern from another institution will be informed of the extent to which their previous work reduces their 12-quarter Enrollment Requirement. A transfer student is one who has enrolled for a minimum of one year as a degree-seeking student at another institution. All transfer students have a six-quarter minimum UER. Transfer students who enter the University with four or more credits will not be allowed any further credit toward the UER for courses taken at other institutions. All transfer students, regardless of the amount of credit previously earned, must complete nine full-time quarters at Northwestern before becoming eligible for a quarter at no tuition charge.

Add the following section:

Appeals

Students who are denied any exceptions to the UER may appeal
to the University Enrollment Appeals Committee. Contact the Office of the Registrar for further information on this process.

For additional information about the University Enrollment Requirement, students may contact the Office of the Registrar, 633 Clark Street, Evanston, Illinois 60208-1118, (708) 491-5234.

Changes in tuition and fees for 1992-93 are listed below:

Undergraduate Tuition
Tuition: each quarter $5,025

Undergraduate Tuition: Exceptions
These rates apply only to special students, part-time students, and other students not subject to the University Enrollment Requirement.

Full-time: each quarter $5,025
Excess courses: each course $1,788
Part-time:
One course, each quarter $1,788
Two courses, each quarter $3,576
Auditor's fee:
Each course audited, each quarter $1,388
Performance study:
P01 Private
Instruction $894
P02 Private Instruction $1,788

Service Fees
Student Hospitalization Plan $625
Study abroad enrollment fee $1,500
Application fee (not refundable) $45
Returned check service fee $15
Duplicate identification card fee $7

Other Fees
Associated Student Government Entertainment fee, each quarter $12
Dependent Hospitalization Plan $1,200

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Last Updated: September 1992
Under Dishonesty in Academic Work, add a new paragraph:

A student may not change his/her registration in a course in which a charge of academic dishonesty is pending or in which such a finding has been made.
In second paragraph of introduction, replace second and third sentences with:

It offers programs for undergraduates enrolled in the school leading to the degree of bachelor of science in education and social policy in one of four programs: Organizational Studies, Psychological Services, Secondary Teaching or Social Policy. Additionally, students enrolled in other schools of the University who qualify for admission to and complete all programmatic requirements of the Secondary Teaching Program also may qualify for secondary certification.

Replace the heading "Secondary Teacher Preparation Program" with "Secondary Teaching."

Under Preparation for Professional Work in Middle and Secondary Schools, final paragraph, delete the phrase "of a wide variety" from the last sentence.

Under Distribution Requirements, IV. Humanities, replace second item with

- English literature

Replace the heading "VI. Health and physical education" with "VI. Health and physical development." Replace the item under this heading with

- Three noncredit physical education courses, one of which must be fitness.
Under Additional Requirements for Certification, add:

- Applicants must be U.S. citizens, or in the process of becoming a citizen.

Under Professional Core, second item, add "or 205-C03 Problems in the Philosophy of Education."

Under Teaching Major Requirements, replace last sentence of introduction with:

Teacher certification candidates are required to meet each quarter with the advising staff of the Office of Student Affairs.

Under Biological and Physical Sciences, Biological Sciences, first item (Core Courses), delete "409-A63."

Replace second item with:

- Botany: three courses chosen from 408-C51, C52, C90; 409-A03, A04, A66

Replace third item with:

- Zoology: three courses chosen from 408-C92; 409-C12, C20, C45; 412-C04, C06, C21, C25, C34, C35, C56

Under Chemistry, fourth item (Advanced), replace "411-C25" with "411-C29."

Under English, replace third item with:

- Language: one course chosen from 434-B03, B06, B07, or B08

Under Foreign Languages, French, replace first item with:

- Introductory: 455-B02; B03; B10; B80-1 or B80-2
From second item (Language), delete "455-C05 or 434-C07."

From fourth item (Other), delete "one C-level elective."

Under Mathematics, first item (Calculus/analysis), add "C16" to the end of the course list.

From second item (Geometry), delete "C13."

From third item (Algebra), delete "C41."

Under Social Sciences, History, replace first item with:

- Analysis: two courses chosen from 427-A01, A02, A03, C89, C92, C93

Under Economics with History, first item (Prerequisites), replace "B80" with "B81."

Under Political Science with History, first item (Prerequisites), delete "B70."

Under Sociology with History, replace second item with:

- Methods courses: 471-B26; C06; C69; C03 or C29

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Under Courses Primarily for Juniors, Seniors, and Graduates, change course descriptions:

205-B41-0 Methods and Techniques of Teaching at the Secondary Level Replace third sentence with "Minimum of 100 hours of observation in selected schools."

225-C02-0 Human Development: Adulthood and Aging Psychological, sociological, and biological theoretical perspectives and research on adulthood. Stability and change in the body, mind, and social relationships.
Change 205-C26-0  Mathematics in the Elementary School to 210-C26-0.

Change 205-C28-0  Instructional Design to 210-D29-0.

Add:

230-C02  The Human Personality
The course examines four major and fundamental ways in which scientists may comprehend the whole person in his or her societal and historical context. The four frameworks conceive of the person respectively in terms of (1) intrapsychic mysteries, (2) interaction episodes, (3) interpretive structures, and (4) interpersonal stories. Within these four frameworks, the course examines such topics as unconscious motivation, object relations and the ego, human instincts and sociobiology, personality traits and the prediction of behavior, social learning theory, the existential agenda for human personality, humanistic psychology, cognitive systems and personality, the development of self, psychobiography and life histories, and life as narrative.

230-C51  Topics in Counseling Psychology: Towards a Psychology of Women
Reflecting current thinking, this course reviews the literature on female development and psychology focusing specifically on the issue of identity and self-esteem. Drawing heavily from those influenced by Freud and Jung, the course will also examine the trend of calling for a re-conceptualization of the theoretical framework.

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Last Updated: September 1992

- Engineering and Applied Science, School of
  General Engineering Courses
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering and Computer Science
- Industrial Engineering
- Materials Science and Engineering
- Mechanical Engineering
- Organizations for Engineering Students

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Last Updated: September 1992
In second paragraph of introduction, replace second sentence with: "During the junior year, students participate in the Teaching Newspaper program or the Teaching Television program, receiving course credit for an academic internship at 1 of about 50 newspapers located in 25 states or at television stations nationally."

Under Academic Policies, Program of Study for the Degree of Bachelor of Science in Journalism, second paragraph:

Replace second sentence with: "During the junior year, students take Editing I and participate in the Teaching Newspaper program or the Teaching Television program where they will take reporting and editing courses at 1 of about 50 daily newspapers in the United States or at television stations nationally."

Replace fourth and fifth sentences with: "A selected group of students in broadcast or magazine journalism may participate in either Teaching Television or experimental Teaching Magazine, which are similar to Teaching Newspaper. Students who encounter financial hardship while on the Teaching Newspaper program or the Teaching Television program may apply to the school's Benjamin H. Baldwin Fund for additional support."

Under Requirements for the Degree of Bachelor of Science in Journalism, #4 Required journalism courses:

After "C20-2 Reporting (2 units of credit)," insert "or C60-2 Broadcast News (2 units of credit)."

After "C21-2 Copyediting II," insert "or C62-2 TV News Editing II."
Change: "C21-1 Copyediting I" to "C21-1 Editing I"
"C21-2 Copyediting II" to "C21-2 Editing II"
"C60-0 Broadcast Writing" to "C60-1 Broadcast Writing"
"C62-0 TV News Production" to "C62-1 TV News Editing I"

Under Grade Requirements, replace third item ("A grade of F...") with:

"A grade of F and/or N earned twice in the same required course shall be grounds for mandatory transfer out of Medill."

Replace fourth item ("The only course...") with:

"Students must earn a C or better in Newswriting and Editing I and have a minimum 2.25 grade point average in Basic Writing, Newswriting, and Editing I to be eligible for the Teaching Newspaper program or the Teaching Television program. Any student earning a C- or below in Newswriting or Editing I must repeat the course to qualify for TN or TTV."

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Under Courses, Required Courses, change course description:

325-C20-1,2 Newswriting and Reporting
Add:  C20-2 not required if replaced by C60-2.

Change course title and description:

325-C21-1,2 Editing I and II
Add:  C21-2 not required if replaced by C62-2.

Under Elective Courses, replace 325-C60-0 Broadcast Writing with:

325-C60-1,2 Broadcast Writing and Broadcast News
Introduction to broadcast journalism.  1. Writing.  Focus on writing techniques for broadcast as well as story production.
Prerequisite:  C20-1. 2. News (2 units).  Orientation to
most aspects of television newsroom operations. Emphasis on writing and news gathering. Prerequisites: C60-1 and junior standing. To be taken concurrently with TV News Editing II C62-2 as part of the Teaching Television program.

Replace 325-C62-0 TV News Production with:

325-C62-1,2 TV News Editing I and II
1. Basics of production for television news. Working behind the scenes in constructing a news broadcast, selecting stories and using graphics. Prerequisites: C60-1 and senior standing. 2. Practice in producing news programs and videotape editing. To be taken concurrently with Broadcast News C60-2 as part of the Teaching Television program.

Change course description:

325-C61-0 Broadcast Reporting
Change prerequisites to "C60-1 and senior standing."

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Last Updated: July 1991
Music Supplement 1991-1993

- School of Music
- Department of Musical Performance Studies
- Department of Academic Studies and Composition
- Interdepartmental Studies
- General Music Studies for Nonmajors
- Church Music and Organ
- Music Education
- Music History and Literature
- Conducting
- Piano
- String Instruments
- Wind and Percussion Instruments
- Voice and Opera
- Theory and Composition

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Last Updated: December 1991

- Communication Sciences and Disorders
- Performance Studies
- Theatre

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Last Updated: July 1991
Other Supplements: 1991-1993

- International Studies Program

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Last Updated: Dec. 13, 1991
Administration and Faculty: College of Arts and Sciences

College of Arts and Sciences

Administration

Add:    Gerald L. Mead, PhD
        Assistant Dean and Associate Professor of French

African and Asian Languages Program

Add:    Kiyomi Kagawa (MA Illinois)
        Lecturer

        Chizu Kanada (MA British Columbia)
        Lecturer

Delete: Mitsuhiro Umezu

Anthropology

Add:    Gillian Bentley (PhD Chicago)
        Assistant Professor

Change:  Helen B. Schwartzman to Professor

Delete:    George Dalton

Art History

Add:    Ikem Stanley Okoye (MS University College, London)
        Lecturer

        To Whitney Davis, add: also Comparative Literary Studies
Change:  Nancy J. Troy to Professor, and delete "Chairperson"
        S. Hollis Clayson to Hollis Clayson; change
Assistant Professor to Associate Professor
        David T. Van Zanten to Professor and
Chairperson
        Otto K. Werckmeister to O. K. Werckmeister; change
Comparative Literature and Theory to Comparative
Literary Studies
Delete:  Eli Bentor

Art Theory and Practice
Add:    Gary Justis (MFA Art Institute of Chicago)
        Lecturer
Delete:  Maryrose P. Carroll

Biological Sciences, Undergraduate Program in
Add:    John Mordacq (PhD Northwestern)
        Lecturer and Director of Undergraduate
        Laboratories
Change:  Richard I. Morimoto to Associate Professor and
        Director
Delete:  Joy Schochet

Chemistry
Add:    Martin F. Jarrold (PhD University of Warwick, UK)
        Professor
        Frank E. McDonald (PhD Stanford University)
        Assistant Professor
        Chad A. Mirkin (PhD Penn State)
        Assistant Professor
Fred J. Northrup (PhD University of Toronto)
Lecturer

Jonathan Widom (PhD Stanford University)
Associate Professor

Change: Mark A. Ratner: delete "and Chairperson"
Daniel P. Weeks to Senior Lecturer and Director
of Studies

Delete: A. Louis Allred
Peter B. Mackenzie
David L. Ollis

Classics

Add: Shannon Byrne-Cueva (MA University of Florida)
Lecturer

Martin Mueller (PhD Indiana)
Professor of English and Classics

Lena Thodos (MA Northwestern)
Lecturer

Robert Wallace (PhD Harvard)
Associate Professor

Delete: Linda Gillison
Diane Rayor

Economics

Add: Lawrence J. Christiano (PhD Columbia)
Professor

Joseph Ferrie (PhD Chicago)
Assistant Professor

Per Krusell (PhD Minnesota)
Assistant Professor
Rosa L. Matzkin (PhD Minnesota)
Associate Professor

Wolfgang Pesendorfer (PhD UCLA)
Assistant Professor

Change: Chairperson from John C. Panzar to Robert J. Gordon
        Marcus Alexis to Board of Trustees Professor
        Kyle Bagwell to Associate Professor
        Bo Honor: to Associate Professor
        Kiminori Matsuyama to Associate Professor

Delete: Alex Anas
        B. Douglas Bernheim
        Charles W. Calomiris
        George Dalton
        Daniel Sullivan
        Steve R. Williams
        Christopher Winship

Add: Madhu Dubey (PhD Illinois)
     Assistant Professor

     Olakunle George (PhD Cornell)
     Assistant Professor

     Terry Mulcaire (PhD Calif Berkeley)
     Assistant Professor

     Julia Stern (PhD Columbia)
     Assistant Professor

     Charles Wasserburg (MA Michigan)
     Visiting Assistant Professor

     Anne Winters (MA Columbia)
     Visiting Assistant Professor
William Worthen (PhD Princeton)  
Professor; also Theatre

Change: Helen Deutsch to (PhD California-Berkeley)  
Christine Froula to Professor  
Barbara J. Newman to Professor  
John Payne to Johnny Payne  
Mary Beth Rose to Adjunct Associate Professor  
Under Christine Froula, Lawrence Lipking,  
Martin Mueller, change "Comparative Literature and Theory" to  "Comparative Literary Studies"

Delete: Joanna Anos  
Beth Nugent

French and Italian

Add: Kathryn Aschheim (PhD Yale)  
Visiting Assistant Professor

Scott Durham (PhD Yale)  
Assistant Professor

Patrick A. Rumble (PhD Toronto)  
Visiting Assistant Professor

Change: Bernadette Fort to Professor  
Concettina Pizzuti to Senior Lecturer

Delete: Nathalie LaColley  
Charles G. Whiting

Geological Sciences

Add: David J. Hollander (PhD ETH-Zürich, Switzerland)  
Assistant Professor

John W. Rudnicki (PhD Brown)  
Professor; also Civil Engineering

Bradley B. Sageman (PhD Colorado)  
Assistant Professor
German Language and Literature

Add:    Peter Fenves (PhD Johns Hopkins)
        Associate Professor

        Ellen Risholm (PhD Wisconsin)
        Lecturer

Hispanic Studies

Change:    E. Inman Fox to Professor and Chairperson
           Humberto E. Robles to Martin J. and Patricia Koldyke Outstanding Teaching Professor

Delete:    Hugo Achugar
           Hazel Gold

Linguistics

Change:    Beth C. Levin to Associate Professor

Delete:    David J. Weir

Mathematics

Add:    Daniel I. Tataru (PhD Virginia)
        Assistant Professor

        Sijue Wu (PhD Yale)
        Assistant Professor

Change:    Sandy I. Zabell to Professor
           Allen Devinatz to Emeritus

Delete:    Catherine Carroll
           Sen Hu
           Joshua Leslie
           Robert D. Thompson

Philosophy
Add:    Connie Rosati (PhD Michigan)
    Assistant Professor

    Thomas Ryckman (PhD Columbia)
    Assistant Professor

Political Science

Add:    Timothy Feddersen (PhD Rochester)
    Instructor

Change:  Jonathan D. Casper to Professor; also Center for Urban Affairs and Policy Research
    Wesley G. Skogan to Professor and Chairperson; also Center for Urban Affairs and Policy Research
    Jung-En Wo to Meredith Woo-Cumings

Delete:   Valerie J. Bunce
    R. Barry Farrell
    William L. F. Felstiner
    Ronald J. Herring
    Evelyne Huber
    James D. Johnson
    William Sampson
    John Stephens

Psychology

Add:    Ian H. Gotlib (PhD Waterloo)
    Professor

    Douglas L. Medin (PhD South Dakota)
    Professor

    Sandra R. Waxman (PhD Pennsylvania)
    Associate Professor

Change:  Jeremiah M. Faries to Assistant Professor

Delete:   Susan R. Breuer
    John D. E. Gabrieli
Religion

Add: Cristina Traina (ABD Chicago)
     Instructor

Change: Richard Kieckhefer to Professor
        George D. Bond to Acting Chairperson
        Barbara Newman to Professor; also English and
Comparative Literary Studies
        Edmund Perry to Emeritus
        Stephen Toulmin to Emeritus

Slavic Languages and Literatures

Add: Andrew Wachtel (PhD Berkeley)
     Associate Professor

     Hanina Hanoch (MA Chicago)
     Lecturer

Sociology

Add: Kenneth Dauber (PhD Arizona)
     Assistant Professor

     Mark Granovetter (PhD Harvard)
     Professor

     Karl Monsma (ABD Michigan)
     Instructor

Delete: Christopher Winship
        William Sampson

Statistics

Add: Yi Cheng (PhD Minnesota)
     Assistant Professor
Change: Bruce D. Spencer to Professor
        Sandy L. Zabell to Professor

Writing Program

Add: Frances Paden (PhD Northwestern)
     Lecturer

School of Education and Social Policy

Administration

Change: Margaret B. Lee to Associate Dean for Student Affairs, Coordinator of Undergraduate Studies, and Professor Emeritus of Education and Social Policy

Delete: Alison Hilsabeck

Faculty

Add: Robert S. Goldberg (MS Illinois)
     Clinical Associate in Teacher Education

Sophie Haroutunian-Gordon (PhD Chicago)
Associate Professor

Richard J. Koerner (MA Ohio)
Clinical Associate in Teacher Education

Brian J. Reiser (PhD Yale)
Associate Professor

Change: Robert Boyle to Robert R. Boyle
        Eric U. Edstrom Jr.: change degree to "MA Illinois"
        Jeremiah Faries: change degree to "PhD Princeton"
        Carol D. Lee: change degree to "PhD Chicago"
        Margaret B. Lee to Professor Emeritus
        Susan Lee to Susan A. Lee
Delete: Mary Frances Crabtree
Sherri Medwin
Anita Nothdurft
Susan C. Salay

Robert R. McCormick School of
Engineering and Applied Science
Administration

Add: Stephen H. Carr, PhD
Assistant Dean for Undergraduate Affairs and
Professor of Biomedical Engineering,
Chemical Engineering, and Materials Science and
Engineering

Katherine T. Faber, PhD
Associate Dean for Graduate Studies and Research
and Professor of Materials Science & Engineering

Geraldine O. Garner, PhD
Assistant Dean and Director, Murphy Cooperative
Engineering Education Program and
Assistant Professor of Cooperative Engineering
Education

Change: Leon M. Keer to Professor of Civil Engineering and
Mechanical Engineering

Biomedical Engineering

Add: Natacha De Paola (PhD Harvard)
Assistant Professor

David Mogul (PhD Northwestern)
Assistant Professor

David Kelso (PhD Northwestern)
Associate Professor

Chemical Engineering
Change: Harold H. Kung: delete "Chairperson"
William T. Brazelton: delete "Professor"
Wesley R. Burghardt to Assistant Professor
Stephen H. Carr to Professor and Assistant Dean for Undergraduate Affairs, McCormick School; also Biomedical Engineering and Materials Science and Engineering
William C. Cohen to Professor, Acting Dean, McCormick School 9/1/92-8/31/93, and Associate Dean for Industrial and Academic Affairs
Julio M. Ottino to Walter P. Murphy Professor and Chairperson
John M. Torkelson to Professor; also Materials Science and Engineering

Delete: S. George Bankoff

Civil Engineering

Add: Bruce E. Rittmann (PhD Stanford)
John Evans Professor of Environmental Engineering

Change: Raymond J. Krizek to Professor; also Chemistry
Jan D. Achenbach: add "McCormick School Professor"
Ted B. Belytschko to Walter P. Murphy Professor; also Mechanical Engineering
Leon M. Keer to Professor and Chairperson; also Mechanical Engineering
Edwin C. Rossow to Associate Professor, Charles Deering McCormick Professor of Teaching Excellence

Delete: Alexandros Anas
Andre de Palma
Lyle F. Mockros

Electrical Engineering and Computer Science

Add: Erwan Bigan (PhD Paris)
Assistant Professor

Christopher W. Clifton (PhD Princeton)
Assistant Professor

Seng-Tiong Ho (PhD MIT)
Assistant Professor

Bruce K. Holmer (PhD Calif Berkeley)
Assistant Professor

Lina Massone (PhD Genoa)
Assistant Professor; also Physiology

Eric J. Schwabe (PhD MIT)
Assistant Professor

Valerie E. Taylor (PhD Calif Berkeley)
Assistant Professor

Philip J. Woest (PhD Wisconsin-Madison)
Assistant Professor

Change:  Kenneth D. Forbus to Professor
        Aggelos K. Katsaggelos to Associate Professor
        Prem Kumar to Professor
        Jorge Nocedal to Professor
        Jorge Nocedal to Professor
        Christopher K. Riesbeck to Professor and
        Associate Director, Institute for the Learning Sciences
        Majid Sarrafzadeh to Associate Professor

Delete:   David J. Weir
          Erwin H. Bareiss

Engineering Sciences and Applied Mathematics

Add:      Vladimir A. Volpert (PhD Moscow State)
          Assistant Professor

Change:  Stephen H. Davis:  delete "Chairperson"
          Moshe Matalon to Professor of Applied
          Mathematics
          W. Edward Olmstead:  add "Chairperson"

Delete:   Joseph W. Jerome
Mark A. Pinsky  
Donald G. Saari

Industrial Engineering

Add:  Mark S. Daskin (PhD MIT)  
Professor; also Civil Engineering  
Transportation Center

Eitan Zemel (PhD Carnegie Mellon)  
Harold L. Stuart Professor of Operations Research; also Managerial Economics & Decision Sciences

Change:  Sanjay Mehrotra to Associate Professor  
Mark L. Spearman to Associate Professor

Delete:  Wen-Lian Hsu

Materials Science and Engineering

Change:  Julia R. Weertman: delete "Chairperson"  
Scott Barnett to Associate Professor  
Stephen H. Carr to Professor and Assistant Dean for Undergraduate Affairs, McCormick School; also Biomedical Engineering and Chemical Engineering  
Yip-Wah Chung: add "Chairperson"  
Jerome B. Cohen to Frank C. Englehart Professor of Materials Science; McCormick School Professor; Dean, McCormick School  
Katherine T. Faber to Professor and Associate Dean for Graduate Studies and Research, McCormick School  
Morris E. Fine to Walter P. Murphy Professor Emeritus

Gregory B. Olson: add "Assistant Chairperson"  
Monica Olvera de la Cruz to Associate Professor  
John M. Torkelson to Professor; also Chemical Engineering

Mechanical Engineering

Add:  L. Catherine Brinson (PhD Caltech)
Seth H. Lichter (PhD MIT)
Professor

Change: Ted Belytschko to Walter P. Murphy Professor; also Civil Engineering

Delete: Lewis Erwin

McCormick School At Large

Add: Geraldine O. Garner (EdD Virginia Polytechnic) Assistant Dean and Director, Murphy Cooperative Engineering Education Program and Assistant Professor of Cooperative Engineering Education

Delete: Baylor Gibson

School of Speech

Theatre

Add: Linda Roethke (MFA Iowa) Assistant Professor

William Worthen (PhD Princeton) Professor:

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Office of the Registrar, Northwestern University
Last Updated: September 1991
Under Foreign Language Requirement, change item (c) to read "by successful completion at Northwestern of course work designated by the Committee on Language Proficiency with a grade of C- or better."

Under Distribution Requirements, add: "Beginning Fall 1992, courses taken to satisfy CAS distribution requirements may not be taken under the P-N Option."

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Last Updated: September 1992
Under Social and Behavioral Studies, add:

404-B30-0 The Civil Rights Movement
An interdisciplinary analysis of the civil rights movement, focusing on the period between the end of World War II and 1966. Subtopics will include opposition to the movement, competition among movement organizations, radicalization, and the movement as a problem in historiography.

Under Social and Behavioral Studies, Historical and Comparative Studies and Cultural Studies of the Black Experience, add:

404-C80-0 Topics in African-American Studies
Advanced work on special topics. Topics may be social, cultural or historical in nature. Examples: Images of Black Women in the Diaspora; Urban Revolts of the 1960's; The Black Church in the Nineteenth Century.

Under Historical and Comparative Studies, change:

404-B14-1,2 History of Racial Minorities in North America
After 2., change "1565-1974" to "1865-1974."

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Office of the Registrar, Northwestern University
Last Updated: September 1992
Senior majors enroll in a three-quarter sequence, American Culture C90, and prepare a senior project under the direction of a faculty sponsor.
Under Courses Primarily for Juniors, Seniors and Graduates, add:

403-C84-0  Introduction to Zooarchaeology
Introduction to the study of animal bones from archaeological sites. Topics include: identification, quantification, hunting economies, domestication, and herding systems in complex societies. Prerequisite: B14, C01 or C02, or instructor's permission.

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Under Courses Primarily for Freshmen and Sophomores, change course description:

405-B01-1,2,3 Introduction to the History of Art
Architecture, sculpture, painting, and allied arts in relation to their social and historical settings. 1. Antiquity and the Medieval world. 2. World Arts in Social Perspective. 3. From the Renaissance to the present.

Under Courses Primarily for Juniors and Seniors, change course title:

405-C68-0 Special Topics in Modern Art and Performance

Change course title and description:

405-C89-0 Special Topics in Non-Western Art
Content varies. Samples: Art and Architecture of the Ancient Maya; African Architecture.

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Under Program of Study for Majors in Biological Sciences, Areas of Concentration, add:

For students declaring a Concentration after September 1, 1992, the allowed Concentrations are reduced to five. These five are: Molecular and Cell Biology, Biochemistry and Biophysics, Evolutionary Biology, Neurobiology, and Physiology. Students should consult the 1992-93 edition of "Introducing Biological Sciences" (available at the Program office) for listings of core Concentration courses in each of these five areas.

Under Integrated Science Program:

Change the second sentence to read: "Students majoring in ISP who wish to complete a second major in Biological Sciences should fulfill the following requirements instead of those listed above. They may not substitute ISP C98 for any biology or chemistry course in the ISP curriculum and must take the following courses:"

Following "- An appropriate laboratory course for the chosen concentration:"

Following "- An appropriate laboratory course for the chosen concentration:"

Following "- An appropriate laboratory course for the chosen concentration:", the change the course list to: "408-C54, 412-C05, or 409-C45".

Add: NOTE: There are now only five Concentrations in Biological Sciences, as noted above. For ISP students, the "Evolutionary Biology" and "Physiology" Concentrations replace the "Evolutionary Biology and Population Genetics" and "Systems" Concentrations, respectively, without change in coursework. Required courses for ISP/Biological Sciences students in the "Molecular and Cell Biology" Concentration
include 408-C15, 408-C90, and 408-C91.

Under Core Courses, change:

409-B10-1 Biology
Add the following to the prerequisites: "All CAS students entering Northwestern from September 1992 onward (other than those entering with an AP score in Biology of 5 or higher) must take a Biology Placement Exam prior to entering 409-B10-1. Depending on the results of that exam, an A-level biology course may be required as a prerequisite for 409-B10-1."

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Under Courses Primarily for Undergraduates, change course title:

409-C12-0 Evolutionary Processes

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Under Undergraduate Certificate in Business Institutions, first sentence, after "completion" add: "(with a grade of C- or above)." In the third sentence, after "may approve courses," add: "(including C94 Senior Linkage Seminars, or C80 Junior Tutorials)."

Under Required Core Courses, change first listing to read:

- Economics B01 and B02 (which together count as one course) or Economics C10 Microeconomics.

Under Elective Courses, - Option B, delete:

American Culture C94 Private Interest and the Public Good
American Culture C94 Philanthropy and American Society

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Under Programs of Study for Departmental Majors, Chemistry Program with Biochemistry Emphasis, change the material in parentheses from "(C35, C61 and B15 or C56)" to "(C35, C61 and B15 or C45)."

Under Integrated Science Program, replace the second sentence with: "Students majoring in ISP who wish to complete a second major in chemistry should fulfill the following requirements instead of those listed above. They may not substitute ISP C98 for any chemistry or physics course in the ISP curriculum, and must take the courses listed under one of the following options."

Under Courses Primarily for Freshmen and Sophomores, delete:

411-A04-0  General Physical Chemistry

Add:

411-B01-0  Chemistry of Nature and Culture
Chemistry for the nonscientist. Discussion of chemicals commonly encountered in everyday life. No prerequisites. With laboratory.

411-B02-0  Color Science
A course in chemistry for students majoring in subjects other than the physical or biological sciences. The science necessary to understanding color will be introduced. No prerequisites.

Under Courses Primarily for Juniors and Seniors, add:
411-C97-0 Medicinal Chemistry: the Organic Chemistry of Drug Design and Action
Introduction to principles of drug design and mechanisms of drug action from a chemical point of view. Historical introduction, drug design and development, receptors, enzyme and enzyme inhibitors, drug metabolism, and pro-drugs.
Prerequisites: Chemistry B10-3 or B12-3 or consent of instructor.

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Under Courses in Latin Primarily for Undergraduates, delete:

413-A13-0  Exercises in Latin Composition
413-C07-0  Medieval Latin Literature

Change course descriptions:

413-A01-1,2,3  Elementary Latin
A course in classical Latin grammar, with graded readings for translation and discussion. Four class meetings a week.

413-A02-1,2,3  Intermediate Latin
Readings from selected prose authors and discussion. This course to be phased out in 1993-1994.

413-B01-1,2,3  Introduction to Latin Literature
A course in classical Latin grammar and vocabulary with graded readings from selected authors for translation and discussion. Four class meetings a week.

Under Courses in Greek Primarily for Undergraduates, change course description:

415-A01-1,2,3  Elementary Greek
Basic vocabulary, forms and syntax of the Homeric dialect of ancient Greek. 1. Introductory material; reading of the opening lines of the Iliad I. 2. Review; continued reading in Iliad I. 3. Further selections from the Iliad.

Add:

415-A06-1,2,3 Modern Greek I
Reading, writing and speaking Modern Greek. Systematic
review of vocabulary, grammar, sentence structure, and etymology. During Winter and Spring Quarters modern Greek literature (primarily poetry) will be introduced. Given alternate years with 415 B06-1,2,3.

415-B06-1,2,3 Modern Greek II
The second year of Modern Greek. A short review of first year grammar, vocabulary, and sentence structure, followed by intermediate material. Readings from modern Greek literature (poetry and prose). Given alternate years with 415-A06-1,2,3.

Under Courses in English Primarily for Undergraduates, delete:

414-C55-0 Greek Archaeology

Change 414-B60-1,2 Greek Myth to 414-B60-0 (now a one-quarter course).

Add:

414 C59-0 Topography of Imperial Rome
Examines the topography of imperial Rome in the period of its maximum ancient development, the reign of the Emperor Constantine (early fourth century A.D.). Illustrated with slides and photocopieos (plans and sections of buildings. Presented alternate years with 414-C58-0.

Under Related courses in Other Departments, add:

439-B65-0 Philosophy of Law
439-D20-0 Ancient Philosophy Seminar

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Cognitive Science (new program)

Cognitive Science is a new interdisciplinary major in the College. It will introduce students to the scientific study of cognition, exposing them to the ways in which converging sources of evidence may be integrated to discover the mechanisms underlying the complex, adaptive properties of human cognition. Students will be introduced to current methods in cognitive psychology, linguistics, artificial intelligence and neuroscience (human and animal research). A junior proseminar will expose students to ongoing research in the field by Northwestern faculty. Qualified seniors will be invited to take a senior honors seminar to engage in independent research under the guidance of department faculty and to write a senior thesis.

Program of Study for Majors in Cognitive Science

- Three introductory courses:
  COGN 452-B07-0  Introduction to Cognitive Modeling
  COGN 452-B10-0  Introduction to Cognitive Science: Language, Vision and Memory
  COGN 452-B11-0  Introduction to Cognitive Science: Learning, Representation and Reasoning
- Three basic prerequisites:
  EECS 727-A10-0  Introduction to Computer Programming: PASCAL or A11-0  Fundamentals of Computer Programming;
  PSY  451-B01-0  Statistical Methods in Psychology, or equivalent;
  PSY  451-B05-0  General Experimental Psychology
- Intermediate requirements: three of four required:
  LING 434-B06-0  Syntax and Semantics
  PSY  451-A12-0  Introduction to Neuroscience
  PSY  451-C28-0  Cognitive Psychology
  EECS 727-C48-0  Introduction to Artificial Intelligence
- Advanced electives: six courses chosen from four areas: at least three must be in one area (major emphasis) and at least two must be in another area. Starred courses are required for major emphasis in that area:
Artificial Intelligence
*EECS 727-C25-1  Artificial Intelligence Programming I
EECS 727-C25-2  Artificial Intelligence Programming II
EECS 727-C37-0  Natural Language Processing
EECS 727-C44-0  Design of Computer-Based Problem Solvers
EECS 727-D32-0  Advanced Topics in Computer Vision
EECS 727-D37-1  Advanced Natural Language Processing I
EECS 727-D37-2  Advanced Natural Language Processing II

Cognitive Psychology
PSY  451-C11-0  Human Memory
PSY  451-C22-1,2  Learning and Motivation
PSY  451-C24-0  Perception
PSY  451-C27-1,2  Formal Models of Cognition
PSY  451-C33-0  Psychology of Thinking
PSY  451-C34-0  Psychology of Language
PSY  451-C35-0  Heuristic Decision Processes
PSY  451-C60-0  Human Memory and Cognition
PSY  451-D60-0  Analogy and Similarity

Cognitive Neuroscience
*BIOL 409-B10-3  Biology
N P  412-C02-0  Molecular Neurobiology
N P  412-C03-0  Cellular Neurobiology
N P  412-C04-0  Developmental Neurobiology
N P  412-C06-0  Central Nervous System Physiology
*N P  412-C08-0  Neuroanatomy
N P  412-C77-0  Sensory Neurobiology
PSY  451-C12-2  Neurobiology and Behavior
PSY  451-C21-0  Neuroscience and Behavior

Linguistics
LING 434-B07-0  Phonetics and Phonology
LING 434-C05-0  Lexical Semantics
LING 434-C06-0  Fundamentals of Syntax
LING 434-C09-0  Psycholinguistics
LING 434-C16-0  Phonetics
LING 434-C29-0  Pragmatics
LING 434-C46-0  Computers and Language Analysis
LING 434-C71-0  Morphology
Courses:

452-B07-0  Introduction to Cognitive Modeling
Introduction to artificial intelligence and cognitive science from a nontechnical perspective. Examination of fundamental questions concerning thinking, beliefs, language understanding, education and creativity.

452-B10-0  Introduction to Cognitive Science: Language, Vision and Memory
Scientific study of human cognition with an emphasis on vision, language, and memory. Prerequisite: Psychology A10 or A12 or Linguistics A10, B06, or B07 or permission of instructor.

452-B11-0  Introduction to Cognitive Science: Learning, Representation and Reasoning (Proposed new course)

For additional information on the Cognitive Science Program, see Professor Jeremiah Faries, Department of Psychology.

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Under Courses Primarily for Freshmen and Sophomores, add:

416-B10-0  The Bible as Literature
Selected books of the Hebrew Bible and New Testament studied from a literary perspective; issues of plot, character, genre, narrative strategy, and theories of interpretation.

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Under Courses Primarily for Freshman and Sophomores, change course titles:

417-B01-0  Introduction to Macroeconomics
417-B02-0  Introduction to Microeconomics

Under Courses Primarily for Juniors, Seniors, and Graduates, change course title:

417-C49-0  Industrial Economics

Change course title and description:

417-C56-0  Soviet Economic History and the Transition to a Market Economy
The structure and functioning of the former Soviet economy, with emphasis on ways in which a centrally planned economy differs from a market economy. The difficulties faced by emerging nations of the former Soviet Union in becoming market economies.

Add:

417-C17-0  Population and Economic Growth
The role of population growth in the process of economic growth, and the effect of changes in economic conditions on the growth of population.

417-C26-0  Economic Development in Africa
Economic change in Sub-Saharan Africa, emphasizing current issues and policies in their historical contexts. Topics include agriculture and rural development, industrialization, and international economic relations.
417-C70-0  Environmental and Natural Resource Economics
Introduction to the economics of environmental and natural resource problems. Topics include externalities and the role of property rights, pollution, emission controls, waste disposal, common property problems, renewable resource management (e.g., forests and fisheries), nonrenewable resource use and depletion (e.g., petroleum), recyclable resources (e.g., minerals), water allocation, and management of public lands.

417-C83-0  Economic Forecasting
Introduction to forecasting in economics and business. Techniques for making and evaluating economic forecasts, including univariate regressions, autoregressive and ARMA models, vector autoregressive models, and structural econometric models.

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Under Programs of Study for Departmental Majors, English and American Literature, replace Prerequisites with:

- A choice of any B-level 419 literature course, but not B05, B06, or B07
- Followed by 419-B98 Introductory Seminar in English

Under Related courses, after "European thought and culture (430)," add: 427-B01-1,2 European Civilization.

Under Courses Primarily for Freshmen and Sophomores, change course description:

419-A05-0 Basic Composition
Delete "P/N registration required."

Change 419-B18-0 Literary Traditions to:

419-B98-0 Introductory Seminar in English
and change prerequisite to "B06, B07, or any B-level 419 literature course."

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The primary challenge facing our species is to learn to understand and co-exist with the natural environment. Accordingly, the Environmental Sciences major is designed to provide students with an understanding of the workings of the environment and the relation of humans to it. Environmental science necessarily differs from the more traditional divisions of scientific inquiry. The intellectual approach is that of synthesis, where the focus is concentrated on the integration of knowledge rather than on further refinement of knowledge within a particular scientific field. Also, there is a concern for translating theory into practice so it interfaces strongly with engineering. With this approach, environmental sciences provides a mechanism for motivated, independent students to work in a multidisciplinary framework with a common theme.

The major will give students the expertise to address issues of environmental concern from a scientific basis, such as the relation of society and resources, energy options, health problems of air and water pollution and environmental law. It provides background for employment in environmentally oriented firms, graduate study in any of several different environmental science disciplines and an exceptional pre-professional background for those interested in law or business.

Advisor and Course Selection
As soon as a student has declared a major in environmental sciences he or she should consult with the environmental sciences advisor to plan their programs. A student should try to complete the foundations in science and mathematics courses by the end of the sophomore year.

A student interested in advanced study in environmental biology would also be advised to take the B-level sequence in Biological Sciences and one or two additional quarters of organic chemistry. A premedical student majoring in
environmental sciences should also take these additional courses.

Program of Study for Majors
The major is rigorous but flexible. It requires a basic grounding in the sciences and mathematics, a core curriculum that introduces the student to environmental problems, courses that consider society's impact on the environment and a series of advanced courses tailored to a student's interest. This is capped by a senior seminar where a student participates in environmental research and presents the results.

Foundations in science
In order to obtain the necessary threads of science to understand the fabric of environmental sciences, every major is required to take:
- CHEM 411-A01-0, A02-0, A03-0  General Chemistry
- CHEM 411-B10-1  Organic Chemistry
- PHYX 447-A35-1,2  General Physics
- BIOL 409-A70-0  Concepts of Biology or A90-0  Characteristics of Living Organisms
- GEOL 423-B01-0  Surface of the Earth

Foundations in mathematics
The standard calculus sequence is required because it is an important tool needed to weave the threads of science into the fabric that is environmental sciences.
- MATH 435-B14-1,2,3  Calculus

Core curriculum
An understanding of the various types of environmental fabrics that exist are obtained from the following courses of which any three are required for the major.
- BIOL 409-A04-0  Evolution and Ecology
- C E  720-B06-0

Environmental Literacy
- GEOG 421-B11-0

World Biogeography
- GEOL 423-B04-0

Environmental Geology
Environment and society
Society's place in and interaction with the environment is described in the following courses. A choice of two are required of the major. (Note: Economics C70 has a number of prerequisites.)

- ECON 417-C70-0  Economics of the Environment
- HIST 427-C20-1,2  Environmental History of the U.S.
- PS 449-C71-0  Environmental Politics
- SOC 471-C12-0  Social Basis of Environmental Change

Advanced studies
Depending on a student's interest the following courses will help develop the tools needed to understand in detail specific environmental problems developed in the core curriculum and help prepare one for research. Four of these courses with no more than two from one department are required.

- BIOL 409-C12-0  Evolutionary Processes
- BIOL 409-C20-0  Behavioral Ecology
- CHEM 411-C29-0  Analytical Chemistry with Lab
- CHEM 411-C42-1  Thermodynamics
- GEOL 423-C01-0  Surface Geochemical Processes
- GEOL 423-C02-0  Oceans and Atmosphere
- GEOL 423-C12-0  The Earth's Changing Climate
- STAT 473-C02-0  Elementary Statistical Methods
- CE 720-C58-0  Airphoto Interpretation
- CE 720-C60-0  Environmental Impact Evaluation
- CE 720-C61-0  Public Health Interpretation
- CE 720-C63-0  Community Air Pollution
- CE 720-C66-0  Environmental Biology
- CE 720-C67-0  Chemistry of the Aquatic Environment

Required of all majors:
- ENV 422-C98-1,2  Environmental Research Seminar

This two-quarter course taken in the fall and winter quarters of the senior year brings majors together to participate in seminars given by experts in environmental science both from within the university and the greater local community as well as to present the results of their own studies.
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French and Italian

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Under Programs of Study for Departmental Majors:

Replace entire French Language and Literature section with:

Prerequisites:  B02, B03, B10; 1 unit from B71, B72.

Major courses:  13 units on the C level, including 5 in language (C02-1, C02-2, C03, C91-1, C91-2), 3 in the survey of literature and culture (C15-1,2,3), 2 in undergraduate seminars (C96, C97), and 3 in other French courses on the C level (at least 2 in literature). Students may count up to 2 units in independent study (C99) toward the major.

Related courses (one of the following options):
- 4 courses (at least 2 on the C level) in the humanities or social sciences in topics pertinent to France or the study of language and literature in general.
- 4 units in another foreign language, at least 2 of which are on the B-level or higher.

Replace entire French Studies section with:

Prerequisites:  B02, B03, B10, B80-1, B80-2.

Major courses:  12 units, including 6 in language (C02-1, C02-2, C03, C05, C91-1, C91-2), 2 in the survey of literature and culture (chosen from C15-1,2,3), 2 in civilization (C80, C92/C93), and 2 in seminars (C96, C97).

Related courses: 4 units in courses pertinent to France chosen from the following disciplines, including at least 2 units at the C level and at least 2 in one discipline: [list of disciplines unchanged].
Under Courses with Reading and Discussion in English, change course title:
455-B75-0  Modern French Literature and Culture

Under Courses with Prerequisite in French, add:

455-C15-1,2,3  French Literature and Culture
Intersections of French literature and culture in historical context. 1. Middle Ages, Renaissance and early classical period. 2. Late classicism, Enlightenment and Revolution. 3. Modernism and Postmodernism.

455-C93-F,W  History of Paris
Fifteen-week, one-and-one-half credit version of C92-1.

455-C96-0  Contemporary French Thought
An examination of different perspectives and paradigms for understanding literature and culture.

455-C97-0  Studies in Literature and Culture
In-depth research and analysis of a problem or topic concerning cultural representation.

Change 455-C91-0  Topics in Language to 455-C91-1,2.

Delete:

455-C70-1,2,3  Major Developments in French Literature
455-C98-0  Undergraduate Seminar

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Under Italian, Program of Study for Departmental Majors, change Prerequisites to "B01, B02, B03 or equivalent."

Under Courses Primarily for Undergraduates, add:
457-B01-0  Italian through Newspapers and Magazines: Composition and Conversation
Discussion of issues from Italian media, with frequent oral and written reports. Students will produce their own newspaper or newscast at the end of the quarter. Topics such as: America in Italian media; advertising; immigration; youth culture. Grammar review.

457-B02-0  The Culture of Regional Italy: Conversation
Introduction to major authors and cultural movements throughout the history of Italy, with emphasis on regional differences. Topics such as: cooking and folklore, poetry, city planning, theater, film. Some grammar, emphasis on spoken Italian.

457-B03-0  Culture of Unified Italy: Composition
The idea of unified Italy in literature and culture. Nationalism in poets from Dante to Leopardi; government; influence of television on language; opera; education and childhood. Some grammar; emphasis on written Italian.

Delete:

457-B03-1,2  Intermediate Course in Conversation and Composition
457-B70-1,2  Introductory Survey of Italian Literature

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Under Integrated Science Program, add this sentence at the end of the section: "These requirements replace the usual major requirements listed above."

Under Courses Primarily for Freshmen and Sophomores, change course title:

423-A07-0  Plate Tectonics:  New View of the Earth

Change course description:

423-B04-0  Environmental Geology
Add: "Lab and one day field trip." Change prerequisites to "A01 or B01, Math B14-2, and Chemistry A02."

Under Courses Primarily for Juniors, Seniors and Graduates, change course description:

423-C29-0  Tectonophysics
Introduction of the quantitative description of the kinematics of distributed deformation within plate boundary zones, of Earth's gravity field and geoid, of the principle of isostasy, and of flexure of the crust and lithosphere. Prerequisites:  Math B21, Physics A35-2, or consent of instructor.

Add:

423-C50-0  Physics and Thermochemistry of the Earth's Interior
Finite strain theory, solid solution thermodynamics, phase transitions, subduction zone processes, seismic velocity structures.
423-C51-0  Geological Fluid Processes
Rheology of the crust and upper mantle, deformation mechanisms, textures, microstructures, and physical properties, the interaction of metamorphism and deformation, fluid migration. Prerequisites: B01, Math B14-3, or consent of instructor.

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Under Courses with Reading and Discussion in English, change course description:

425-B10-1,2,3  German Literature in Translation
These courses may be taken independently of one another.  1. 
The German drama.  2. The novella.  3. The German novel.

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Under Courses with Reading and Discussion in English, add:

463-B10-0  The Literature of Spain
A study of major works of Spanish literature of significance to the European tradition: From the late Middle Ages to the present.

463-B11-0  Survey of Latin American Literature
Representative works of Latin American literature from Columbus to the present.

463-C98-0  Topics in Literature
Repetition with different topics for credit. Samples: Single author (Borges, García-Márquez, Galdós, Lorca), The Picaresque Novel, Voices of Women in Colonial Latin America.

Under Courses with Prerequisite in Spanish, add:

463-C04-1,2  Topics in Language
1. Methodology. 2. Grammar and Syntax. Advanced topics course which will focus on the teaching of Spanish at the high school and college levels.

Change course titles and descriptions:

463-C03-0  Advanced Conversation
For advanced students and prospective teachers. Prerequisite: B03.

463-C33-0  Literature and Society in 20th-Century Spain
Course examines how literature gives shape to the social institutions and historical events which circumscribe the reality of 20th-century Spain.
463-C35-0  Literature of Post-Civil War Spain
Trends and tendencies in contemporary Spanish literature.
Prerequisite:  B01 or equivalent.

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Replace the entire Program of Study for Departmental Majors section with:

Prerequisites: B06, B07.
Core courses: C09 or C10; C02 or C17; four selected from C05, C06, C16, C29, C71.
Four additional C-levels (only one may be a C98 or C99).
Related courses: Four courses selected in consultation with a linguistics advisor.
Additional honors requirements: For those wishing to be considered for honors and for those planning graduate work in linguistics, select two from C98, C99, a D-level course.

Under Courses Primarily for Undergraduates, add:

434-C21-0 Field Procedures
Choosing informants, techniques of elicitation, and other problems encountered in field research exercises in the collection and analysis of linguistic data.

434-C24-0 Language and Law
Survey of contemporary social science research on the interaction of language variables and our legal system; and applications of linguistics to the resolution of legal cases.

434-C25-0 Language and Medicine
Examination of social science research on language use, variation and function in medical setting.

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Under Integrated Science Program, replace the second sentence with:

Students majoring in ISP who wish to complete a second major in mathematics should fulfill the following requirements instead of those listed above. They must take a full-year sequence, C10-1,2,3 or C37-1,2,3.

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Under Courses Primarily for Undergraduates, add:

435-A04-0  Games and Fallacies
Number puzzles and games; conceptualizing numbers; common fallacies in ratios, proportions, percentages, probability. The course is designed for non-science students who may never have seen the charm of pure mathematical play nor the spirit of mathematical applications. No prerequisites.

After the entry for 435-B14-1,2,3  Calculus, add the following:

The four-quarter sequence B14-3, B15, B17, B21 and the three-quarter sequences B20-1,2,3, B90-1,2,3, B91-1,2,3 and B92-1,2,3 all cover comparable material. Students who wish to combine courses from different sequences must obtain permission from the Mathematics Department.

Change:

435-A11-0  Survey of Modern Mathematics II
Change prerequisite to "high school mathematics."

435-C08-0  Set Theory and Metric Spaces
Change prerequisite to "B17-0."

Delete:

435-B22-0   Elementary Dynamical Systems with Linear Algebra

435-C02-1,2  Probability and Statistics for Experimenters

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Students in the College of Arts and Sciences may complete their basic science requirement by taking any of the following: Physics A30-1,2 (noncalculus general physics), A35-1,2 (calculus-based general physics), A90-1,2 (physics for majors), A03 (Ideas of Physics), or the astronomy courses for nonspecialists, A01 (Modern Cosmology), A02 (Milky Way Galaxy), and A20 (Highlights of Astronomy). The latter four courses are designed to allow students to explore major ideas in the physical sciences with only high school mathematics.

Under Program of Study for Physics Majors, Required courses for physics majors, replace third item with:

- Modern physics: C36-1,2; and either C37 or C38

Under Three Possible Physics Major Sequences, replace chart with:

<table>
<thead>
<tr>
<th>Sequence 1</th>
<th>Sequence 2</th>
<th>Sequence 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>A-1</td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>A-2</td>
<td>A-1</td>
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<td>C30-1</td>
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<td>A-2</td>
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<td>C30-1</td>
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</tbody>
</table>
Under Required courses for astronomy majors, replace third item with:

~Modern physics:  C36-1,2; and either C37 or C38

Under Integrated Science Program:, add to the end of the first paragraph:

The requirements listed below for ISP double majors replace the usual physics and astronomy major requirements.

Pages 109-110

Under "Required courses for ISP students who wish to complete a major in Astronomy," replace first item with:

- 407-C28-0 or 407-C29-0.

Under Distribution/Elective Courses, Nonscience Majors, replace first line with "The "Ideas of Physics" course, A03, is a series of independent ..."

Under Science and Engineering Majors, replace last four lines with:

... Electricity and Magnetism. Students who have completed C30-1 and C33-1 may enroll in C36-1. Students who have completed C36-2 may enroll in C37 (Introduction to Solid State Physics) or C38 (Introduction to Nuclear and Particle Physics)
Under Physics, Courses Primarily for Undergraduates,

Change 447-A01-A09-0  Ideas of Physics to 447-A03-0.

Delete 447-C36-0  Introduction to Quantum Physics.

Add:

447-C36-1,2  Introduction to Quantum Mechanics
A two-quarter introductory course in nonrelativistic quantum theory and wave mechanics. Topics covered include fundamental axioms, wave-particle duality and uncertainty relations, the Schroedinger equation, and solutions for simple systems. Model systems treated include one-dimensional potential wells, barrier penetration and scattering, harmonic oscillators, Coulomb potential and hydrogenic atoms. Prerequisites: Physics C30-1 and C33-1.

Change prerequisite for 447-C37-0  Introduction to Solid State Physics to "C36-2."

Change prerequisite for 447-C38-0  Introduction to Nuclear and Particle Physics to "C36-2."

Change course title and description:

447-C39-1,2,3  Quantum Mechanics, Nuclear and Particle Physics
For students in ISP. Similar to C36-1,2 and C38, but at a more advanced level and with more detailed discussion. Four lectures. Prerequisite: second-year standing in ISP.

Under Astronomy, Courses Primarily for Undergraduates, change course title and description:

407-A02-0  Milky Way Galaxy
Structure of the galaxy, star formation, interstellar clouds and dust, star clusters, neutron stars and black holes, the galactic center, the future evolution of the Sun and our solar system. Limited enrollment.

Delete 407-A03-0  Galaxies and the Universe.
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Under Program of Study for Departmental Majors, Related courses, replace the second item with:

- Two quarter-courses from among biochemistry, molecular biology, and cell biology; biological sciences; chemistry; neurobiology and physiology; physics.

Under Courses Primarily for Freshmen and Sophomores, B07 and B10 are now listed under Cognitive Science.

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Under Courses Primarily for Freshmen and Sophomores, add:

429-B27-0  Introduction to Medieval Jewish Philosophy
An introduction to the philosophic tradition of medieval Judaism, focusing on the history of Judaism more than on the history of philosophy, through study of the thought of the most important of the medieval Jewish philosophers, Moses Maimonides (1138-1204).

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Under Courses with Reading and Discussion in English,

Change in course numbering:

Slavic C12 has been renumbered B10-3. The entry for C12 should therefore be deleted and the entry for B10 should read as follows:

467-B10-1,2,3 Introduction to Russian Literature
1. Thematic and formal study of major works by Pushkin, Gogol, Turgenev, and Dostoevsky. 2. Dostoevsky, Tolstoy, and Chekhov. 3. The twentieth century.

Change of course title:

467-B57-0 Introduction to the USSR and its Successors

Add:

467-C68-0 Russian Drama
An introduction to the rich dramatic tradition of Russia. Students will read a representative sample of texts from the 19th and 20th centuries, including Pushkin, Gogol, Tolstoy, Chekhov, and Mayakovsky.

467-C90-0 Literature and Politics in Russia
Russian literature has played a central role in defining the nation's political agenda. The course will introduce students to the study of the interaction of culture and politics. Authors to be read include Herzen, Turgenev, Chernyshevsky, and Dostoevsky. All readings in English.

Under Courses in Literature with Prerequisite in Russian,
467-C60-0  Survey of 19th-Century Russian Poetry
An introduction to the analysis of lyric poetry in Russian. Students will have the opportunity to read works of Pushkin, Lermontov, Tiutchev, Fet, and others in the original. Prerequisite: B03-3 or B01-3 or equivalent.

467-C61-0  Survey of 20th-Century Russian Poetry
An introduction to the main poets and schools of Russian 20th-century poetry. Authors to be read include Blok, Mayakovsky, Akhmatova, Mandelshtam, Pasternak, and Brodsky. Prerequisite: B03-3 or B01-3 or equivalent.

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Sociology

Major Requirements
- One sociology course at the introductory level
- Three courses in methods of social research: B26, C03, C29 or C69 (C69 is the 15-week, one-and-one-half credit version of C29)
- C06
- C98-1,2 (two-quarter research seminar) to be taken in the fall and winter quarters of the senior year
- Four additional C-level courses in Sociology
- Related courses: Four C-level courses selected with the approval of the faculty advisor from: African-American Studies, Anthropology, Economics, History, Linguistics, Political Science, Philosophy, Psychology, or Women's Studies

Under Courses Primarily for Undergraduates:

Add "Prerequisite: Any A- or B-level sociology course" to the course descriptions for C02, C05, C07, C09, C10, C12, C14, C15, C19, C21, C23, C24, C27, C31, C32, C39, C45, C50, C55 and C76.

Add "Prerequisite: B26 (however, for 1992-93: Any A- or B-level sociology course)" to the course descriptions for C03, C06, C25, C26, C29 and C69.

Under Research Techniques and Social Theories, add:

471-B26-0 Sociological Analysis
Surveys logic and methods of social research, qualitative and quantitative analysis of social data, ethical issues in
social research, and the relation between social science and public policy. Provides foundation for further course work in social research and for understanding reports of social scientific research.

471-C69-F,W  Field Research and Methods of Data Collection 15-week, one-and-one-half credit version of 471-C29-0.

Change course titles:

471-C06-0  Sociological Theory

Change course descriptions:

471-C30-0  Basic Statistics for Social Research
Add "Prerequisite: permission."

471-C98-1,2  Senior Research Seminar
Add "Prerequisite: C03 or C29."

Under Social Problems and Inequality, change course descriptions:

471-C08-0  Sociology of Deviance and Crime
Add "Prerequisite: A10 or B02."

Under Cities, Population, and the Environment, change course title:

471-B07-0  Problems of Cities

Change course descriptions:

471-C01-0  The City: Urbanization and Urbanism
Add "Prerequisite: A10 or B07."

Under Sociology of Professions, Organizations, and Institutions, change course descriptions:

471-C18-0  Sociology of Law
Add "Prerequisite: A10 or B06."

Under Additional Courses, change course description:

471-C99-0 Independent Study
Add "Prerequisite: permission."

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Under Program of Study for Departmental Majors, Prerequisites, part (a), replace "B16; and B19" with "B15; and B17."

Under Courses Primarily for Undergraduates, change course description:

473-C20-1,2  Statistical Methods
Change prerequisites to "Math C30-1 or Industrial Engineering C02."

Delete 473-C98-1,2  Undergraduate Seminar.

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Women's Studies Program

Under Courses, add:

480-B91-0  Women in Culture and Society:  Topics
The changing role and image of women in society. The goal is to reach an understanding of the "female world" as it functions in the cultural and socio-economic milieu, either in one or several cultural and/or national traditions, during several historic periods or in a particular era. Topics vary; may be repeated with change of topic.

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Under Cooperative Engineering Students, replace paragraph with:

Students enrolled in the Walter P. Murphy Cooperative Engineering Education Program are eligible for tuition rebates in order to make tuition consistent with that of students in their entering class when Co-op students follow the policies and procedures of the Cooperative Education Program.

Page 141

To the list of bachelor of science degrees in the second paragraph, add "Computer engineering."

Pages 142-143

Under Basic Engineering, - Fluids and Solids, add "ChE C21 Fluid Mechanics."

Under ~ Systems Engineering and Analysis, delete "IE B02 Mathematical Modeling" and "IE B03 Introduction to Data Analysis."

Add the following category:

- Probability, Statistics, and Quality Control
  ChE C12 Process Models by Statistical Methods
  CE C06 Uncertainty Analysis in Civil Engineering
  EECS C02 Probabilistic Systems and Random Signals
  IE B03 Probability and Statistics for Engineering
Under Social Sciences/Humanities Theme Requirement, fourth sentence, replace "fine arts and literature" with "fine arts, language, and literature."

Replace last sentence with: "A list of suggested themes and courses that meet these social science/humanities requirements may be obtained from the McCormick Undergraduate Records Office (Rm. 2815) or the Office of Undergraduate Affairs of the McCormick School (Rm. 2396)."

Under Computer Programming, add to the list of programming courses "EECS A11  Fundamentals of Computer Programming."

Under Cooperative Program, replace second paragraph with:

Students in good academic standing normally start the process of interviewing for jobs in the fall of their sophomore year. Seminars are conducted throughout the freshman year to prepare students for this process. The co-op coordinator makes every effort to secure interviews for the students, with the long range goal of obtaining a cooperative work assignment related to the student's professional objectives and in a preferred geographic area.

Under College-Industry Schedule, replace first sentence with:

If necessary, with the help of the academic advisor, special schedules can be worked out that will enable students to complete their academic requirements and co-op on an unique schedule of school and work.

Replace second paragraph with:

Students who choose the regular co-op plan (see the preceding table) or whose employer requests a different
schedule are entitled to tuition rebates making tuition consistent with that of their entering class when the student follows the policies and procedures of the Cooperative Engineering Education Program.

In the third paragraph, delete the second sentence.

Under Current Cooperating Employers, delete: Abbott Laboratories; Accounting by Computer; Author Andersen; Barton-Aschman Associates; Baxter; Caterpillar Tractor; CE-Raymond; Chicago Bridge & Iron; CIA; Fel-Pro; Newport News Shipbuilding; Northern Petrochemical; Westinghouse Electric. Add: Andersen Consulting; NASA, Houston; Wisconsin Electric.

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Change 703-A20-0 Analytic and Computer Graphics to 703-B20-0.

To the description of 703-C65-0 History of Engineering, add: "This course is a history course and cannot be used as a technical elective."

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Under - Biotechnology, replace entire course list with:

Take ME B41 under Basic Engineering
BIOL B10-2 Biology
Take one of the following:
  BMBCB C01  Biochemistry
  BMBCB C15  Cell Biology
  BMBCB C90  Molecular Biology I
  BME C15  Application of Genetic Engineering to Immunobiology

ChE C22  Heat Transfer
ChE C23  Mass Transfer
ChE C71  Transport Phenomena in Living Systems
ESAM C81  Models in Biochemistry & Molecular Biology
Two additional technical electives

Under Courses Primarily for Undergraduates, add:

765-C22-0  Mathematical Modeling of Physiological Systems

765-C26-0  Physiological Imaging
Medical images applied to physiological measurement. Especially radionuclei imaging and design of measurement methods, based on digital gamma camera images. Tomographic reconstruction (X-ray CT, Radionuclide SPECT and PET). Related digital angiography techniques. Includes computer exercises in image manipulation.

765-C44-0  Biological Performance of Materials
Structure-property relationships of materials, physical chemistry of surfaces and interfaces, materials-tissue
interactions, applications to the selection and design of materials for medical implants and devices.

765-C62-0  Musculoskeletal Biomechanics
An introductory class presenting the fundamentals of orthopaedic biomechanics. Topics include mechanical properties of bone, cartilage, ligament, tendon and muscle.

765-C66-0  Biomechanics of Movement
Engineering mechanics applied to analyze human movement including: models of muscle and tendon, kinematics of joints, and dynamics of multi-joint movement. Applications of biomechanics in sports, rehabilitation and orthopaedics will be demonstrated.

765-C73-0  Cardiac Mechanics
Mechanical characteristics of isolated muscle fibers. Mechanical behavior of isolated left ventricle. Centricular wall stresses. Right heart, lung, left heart interactions. Heart, systemic system and venous system interactions.

765-C80-0  Biomedical Transducers and Instrumentation
This class will explore transducers and instrumentation used to quantify temperature, displacement, force, pressure, sound and flow. Optical spectroscopy, electrodes for biopotentials and chemical measurements, and mass spectroscopy will also be discussed. Select assays based upon radioactivity, NMR spectroscopy, enzyme reactions (e.g., ELIZA), electrophoresis and flow cytometry will be presented in lecture and student oral reports. Laboratory sessions cover the measurement of temperature, pressure, blow and force.

765-C83-0  Cardiovascular Instrumentation
Theory, design and application of instrumentation used for diagnosis, monitoring, treatment, and research investigation of cardiac and cardiovascular diseases. Examples will be taken from the current literature.

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The Undergraduate Chemical Engineering Laboratory provides facilities for exploring firsthand the quantitative experimental implications of fundamental laws in their application to practical problems of heat transfer, reaction kinetics, gas absorption, distillation, and other basic operations. Process dynamics and automatic control principles are studied in the Process Dynamics Laboratory, furnished with typical control equipment plus a number of Zenith microcomputers, supplemented by the digital computer facility at Academic Computing and Network Services. A computing laboratory is also used in a variety of courses, and chemical laboratory experience is a part of the polymer course.

Under Curriculum, Basic Engineering, Fluids and Solids, replace "ME B41 Fluid Mechanics I" with "ChE C21 Fluid Mechanics."

Under Areas of Specialization:

Under Environmental Engineering, to the first three lines add: "or ChE C61 Introduction to Polymers."

Under Polymer Science and Engineering, replace entire course list with:

ChE C61 Introduction to Polymers
(if not already in Departmental Program)
or MSc C31 Physical Properties of Polymers
Suggested electives (3):
  Chem B10-3 Organic Chemistry III
  ChE C12 Process Models by Statistical Methods
  ChE C67 Fabrication of Microelectronic Devices
  MSc C31 Physical Properties of Polymers
  MSc C60 Introduction to Electron Microscopy
  MSc C61 Crystallography and Diffraction
  ChE D08 Kinetics and Reactor Design
  ChE D62 Viscoelasticity and Flow in Polymer Systems
  ChE D69 Selected Topics in Polymers
  MSc D44 High Polymers in Solid State

Under ~ Process Control and Simulation, replace first two lines with:

One B- or C-level chemistry course
or ChE C61 Introduction to Polymers
ChE C45 Process Optimization

Page 158

Under Courses Primarily for Undergraduates:

710-B10-0  Analysis of Chemical Process Systems  Under "Prerequisites," replace "Chem A03" with "Chem A03 or A72."

710-C12-0  Process Models by Statistical Methods  Add: "Prerequisite:  Junior standing."

710-C23-0  Mass Transfer  Replace courses under "Prerequisites" with "C21 and C22."

710-C71-0  Transport Phenomena in Living Systems  Under "Prerequisites," replace "C23 and ME B41 recommended" with "C21 and C23 recommended."

710-C75-0  Biochemical Engineering  Replace courses under "Prerequisites" with "C07, C23 or BMBCB C01, senior standing or consent of instructor."
Add:

710-C21-0  Fluid Mechanics
Prerequisites: CE B12 and Math B21.

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Civil Engineering


Under - Construction, add: CE C08 Construction Management.

Under Courses Primarily for Undergraduates, add:

720-C08-0 Construction Management
This course will deal with the construction industry, in general, and construction project management in particular. The operation and organization of a large construction management company will be studied in detail. Prerequisites: Junior standing or permission of instructor.

720-C59-0 Hazardous Waste Management
Identification and classification of hazardous wastes. Regulatory framework. Risk assessment. Control and disposal technologies. Environmental audits. Site assessment and remediation. Prerequisites: Upperclass standing in engineering or science or permission of instructor.

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To the introduction, right above Areas of Specialization, add:

A new program in computer engineering leading to the B.S. degree will be instituted beginning in the fall of 1992. This program allows students with an interest in computers to specialize in the computer area and also obtain an engineering degree. Computer engineering has been defined by the National Science Foundation as "engineering with and of computers". The program is designed to meet growing demands from industry for engineers with a training in both the engineering of computer systems and the use of such systems in engineering applications. The computer engineering curriculum is designed to provide students with a solid background in the fundamentals of electrical engineering together with training in both the hardware and software aspects of computer systems.

Pages 166-167

Replace Computer Science Curriculum section with:

Total Requirement – 48 courses

Mathematics – 6 courses
  Math B14,1,2,3: Calculus
  Math B17: Sequences and Series, Linear Algebra
  Two courses from the CS Mathematics list below

Basic Sciences – 5 courses
  Phys A35-1,2: General Physics
  Three other courses from the Basic Sciences list
Basic Engineering - 6 courses
   EECS B11: Fundamentals of Computer Programming II
   EECS B01: Fundamentals of Computer Organization
   EECS B05: Fundamentals of Computer Systems Software
   IE C02: Probability
   or EECS C02: Probabilistic Systems and Random Signals
   or equivalent.
   Two other courses chosen from the Basic Engineering list, excluding Computer Science courses.

Social Sciences/Humanities Theme Requirement - 7 courses

Communications - 2 courses
   One writing course from approved list
   One speaking course from approved list

Computer Programming - 1 course
   EECS A11 Fundamentals of Computer Programming

Unrestricted Electives - 5 courses

Departmental Program - 16 courses

Required Courses - 8 courses
   Fundamentals:
      EECS C10: Mathematical Foundations of Computer Science
      EECS C11: Data Structure and Data Management
      EECS C36: Design and Analysis of Algorithms
      EECS C20: Formal Languages
   Systems:
      Any two of the following courses:
         EECS C22-1: Compiler Construction I
         EECS C43-1: Operating Systems I
         EECS C55: Computer Architecture I
   Applications:
      Any two of the following courses:
         EECS C28: Numerical Methods for Engineers
         EECS C39: Introduction to Database Systems
         EECS C48: Introduction to Artificial Intelligence
         EECS C51: Introduction to Computer Graphics
Technical Electives - 8 courses.

Of the eight technical electives required, four must be from the Advanced Computer Science course list, two courses must be from any of the three lists below (including the Advanced Computer Science course list), and the remaining two are unrestricted, subject to the approval of the student's departmental advisor.

Courses at the D level are primarily for graduate students, but may be open to advanced undergraduate students with permission. EECS A10 may be used as a technical elective for those students who need additional preparation for A11 or who are transferring from other majors. Courses used as technical electives may not be counted towards satisfying other requirements.

<table>
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<tr>
<th>CS Mathematics List</th>
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<tbody>
<tr>
<td>EECS C52</td>
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<tr>
<td>MATH B15</td>
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<tr>
<th>CS External Technical Electives List</th>
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<tr>
<td>MATH C13</td>
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<td>MATH C26</td>
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<td>ESAM C11-1,2,3</td>
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<th>Advanced CS List</th>
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<tbody>
<tr>
<td>EECS C22-C57, C90, C91, C94-1,2, C95, C99</td>
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</tbody>
</table>
Before Courses Primarily for Undergraduates, add the following section:

Computer Engineering Curriculum

Total Requirement - 48 courses

Mathematics - 6 courses
  B14-1,2,3 Calculus
  B15 Multiple Integration and Vector Calculus
  B17 Sequences and Series, Linear Algebra
  B21 Elementary Differential Equations

Basic Sciences - 5 courses
  Two chemistry courses from approved list
  Physics A35-1,2,3 General Physics

Basic Engineering - 6 courses
  Electrical Science - EECS B41 Circuits I
  Computer Science
    EECS B01 Fundamentals of Computer Organization
    EECS B05 Fundamentals of Computer System Software
  3 courses chosen from three of five categories. The course selection for each category must be consistent with McCormick requirements:
    Mechanics
    Thermodynamics
    Fluids and Solids
    Systems Engineering and Analysis
    Materials Science

Communications - 2 courses
  One writing course from approved list
  One speaking course from approved list

Social Sciences-Humanities/Theme Requirement - 7 courses

Computer Programming - 1 course
  EECS A10 Introduction to Computer Programming in PASCAL
or EECS All Fundamentals of Computer Programming

Unrestricted Electives - 5 courses

Departmental Program - 16 courses

Requirements - 10 courses
EECS B30 Programming Techniques or
EECS B11 Introduction to Computer Science
EECS B42 Circuits II
EECS B43 Signals and Systems
EECS B50 Physical Electronics
EECS C02 Probabilistic Systems and Random Signals
EECS C06 Electronic Circuits
EECS C11 Data Structures and Data Management
EECS C43-1 Operating Systems I
EECS C53 Digital Electronic Circuits and Systems
EECS C55 Computer Architecture I

Design Requirement - 1 course from the following
EECS C41 Design of Real-Time Digital Systems
EECS C46 Microprocessor System Design
EECS C56 Computer Architecture II
EECS C43-2 Operating Systems II
EECS C91 Design of Custom VLSI
EECS C94-2 Software Project Management & Development
EECS C99 Project, when C99 is a design program

Technical Electives - 5 courses from the following
EECS C32 Introduction to Computer Vision
EECS C36 Design and Analysis of Algorithms
EECS C39 Introduction to Database Systems
EECS C47 Digital Electronic Systems Design
EECS C51 Introduction to Computer Graphics
EECS C57 Design Automation in VLSI
EECS C60 Introduction to Feedback Systems
EECS C74 Introduction to Digital Controls
EECS C77 Biomedical Computing
EECS C90 Introduction to Robotics
EECS C94-1 Software Project Management & Development
Courses listed for Design Requirement
Areas of Specialization

The computer engineering curriculum enables students to develop a specialization in one of many application areas by appropriate choice of technical and unrestricted electives. Possible areas include software or hardware design, control systems, computer vision, robotics and others. Given the breadth of the area, the choice of electives should be done in consultation with an advisor.

Pages 168-172

Under Courses Primarily for Undergraduates, the following courses have been changed or added:

727-A01-0  Introduction to Scientific Computing and Fortran
Introduction to the FORTRAN programming language and methodology for the computer solution of engineering problems. Numerical methods appropriate for engineering problems, such as root finding methods and numerical integration techniques will be presented. Co-requisite: concurrent registration in 435-B14-2 or equivalent. Not recommended for computer science majors.

727-A10-0  Introduction to Computer Programming in Pascal
Introduction to the PASCAL programming language. Analysis and formulation of problems for computer solution. Systematic design, construction, and testing of programs. Substantial programming assignments.

727-A11-0  Fundamentals of Computer Programming
Introduction to principles of programming and procedural thinking. Concepts include procedural abstraction, data abstraction, modularity, object-oriented programming. Uses computer facilities and the Scheme programming language. Substantial programming assignments, including numerical and symbolic programs. Required for majors in Computer Science.

727-B01-0  Fundamentals of Computer Organization
Principles of hardware design. Number systems and Boolean algebra. Logic gates. Design of combinational circuits and simplification. Encoders, multiplexors, adders and other MSI

727-B05-0  Fundamentals of Computer System Software
Basics of assembly language programming modes. Macros. System stack and procedure calls. Asynchronous traps and calling system services. Techniques for writing assembler, linkers, and loaders. Recursive reentrant, and position independent code. Prerequisite: 727-B01 or equivalent, 727-A10 or 727-A11 or equivalent programming experience.

727-B11-0  Fundamentals of Computer Programming II
Continuation of EECS A11. Students will be introduced to key concepts in software design and systems programming. Topics include object-oriented programming (in C++), design of interpreters and compilers, and register machines. Required for majors in Computer Science. Prerequisites: 727-A11.

727-B30-0  Introduction to Software Engineering
Advanced material on program design and debugging. Methodologies for the design and implementation of larger programs. Object-oriented concepts and programming in C++. Prerequisites: 727-A01, 727-A10, 727-A11 or any introduction to programming or passing grade in Tech programming proficiency exam.

727-C07-0  Communications
Analysis of analog communications systems including modulation, transmission and demodulation of AM, FM and TV systems. Design issues, channel distortion and loss, bandwidth limitations, and additive noise are examined. Prerequisites: B43 and C02.

727-C10-0  Mathematical Foundations of Computer Science

727-C11-0  Data Structures and Data Management
Change prerequisites to "727-B11 or 727-B30, and 435-B14-3."

727-C25-1  Introduction to Artificial Intelligence Programming
Add prerequisites: "727-A10, 727-A11, or programming experience."

727-C28-0  Numerical Methods for Engineers
Change prerequisites to "727-A01, 727-A10, or 727-A11, and 435-B21 or equivalent."

727-C29,1,2,3  Numerical Analysis
Change prerequisites to "727-A10, 727-A11 or equivalent, 435-B17, 435-B21."

727-C39-0  Introduction to Database Systems
Data models and database design. Modeling the real world: structures, constraints, and operations. The entity-relationship model and logical database design. Various approaches to data modeling are introduced (including network, hierarchical, and object-oriented), although the relational model is emphasized. The use of existing database systems for the implementation of information systems. Prerequisites: 727-C11.

727-C44-0  Design of Computer Problem Solvers
Describes principles and practice of organizing and building artificial intelligence reasoning systems. Topics include pattern-directed rule systems, truth-maintenance systems, and constraint languages. Prerequisites: 727-C25-1 (or equivalent Lisp experience) and 727-C48.

727-C48-0  Introduction to Artificial Intelligence

727-C52-0  Applied Combinatorics
Fundamental problems in combinatorics including selection, arrangements, counting methods, generating functions, and
graph theory, focusing on applications to science and engineering. Prerequisites:
727-C10.

727-C43-1,2 Operating Systems
Provides a fundamental overview of operating systems. (1) Operating system structures, processes, process synchronization, deadlocks, CPU scheduling, and memory management. (2) File systems, secondary storage management, protection and system security, issues in distributed systems, case studies, and special topics. Requires substantial programming projects. Prerequisites: 727-B05 and 727-C11.

727-C55-0 Computer Architecture I
Fundamentals of the basic building blocks of a computer, including arithmetic logic unit, registers, control unit, memory subsystem, and input-output. Introduction to computer-aided design tools. Prerequisite: 727-B05.

727-C56-0 Computer Architecture II
Fundamentals of computer design, including instruction set design, data-path design, memory system, addressing, and pipelining. Computer design project. Prerequisite: 727-C55.

727-C59-0 Digital Signal Processing
Change prerequisite to "B43."

727-C91-0 VLSI Systems Design

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Under Curriculum, replace Basic Engineering section with:
   EECS C17 Data Management and Information Processing (preferred)
   or EECS C28 Numerical Methods for Engineers
Five courses, one from each of the following areas:
   Mechanics
   Thermodynamics
   Fluids and Solids
   Materials Science
   Electrical Science
   (See the Basic Engineering list under Undergraduate Program)

Under Departmental Program, - Applied behavioral science, replace "IE C40 Intro to Organization Theory" with "IE C40 Field Project Methods."

Under - Systems analysis and design, change "IE B01" to "IE B01-1,2."

Under Courses Primarily for Undergraduates, replace 738-B01-0 with:

738-B01-1,2 Introduction to Industrial Engineering (.5 each)
Introduction to the various aspects of industrial engineering with emphasis on applications in industry and public sector. Presentations by IE faculty and outside experts. Practical exercises to familiarize students with the problems and tools of industrial engineering. Must register for two quarters to receive one credit. B01-1 is not a prerequisite for B01-2.

Replace 738-C41-1,2 with:
738-C41-0  Introduction to Organizational Design
Design of operating organizations or their components. Work in planned change and a field project in an operating organization. Prerequisite: C40 or D10 and D11.

Change course titles and descriptions:

738-B03-0  Probability and Statistics for Engineers
Elementary probability; standard probability distribution models; descriptive statistics; inferential statistics including confidence intervals and hypotheses tests; regression and correlation; applications to engineering problems, especially quality control and reliability. Not open to IE undergraduate majors.

738-C03-0  Statistics I
Descriptive statistics; observational and experimental studies; confidence interval estimation; hypothesis testing; categorical data; simple linear regression and correlation. Prerequisite: C02 or equivalent.

738-C04-0  Statistics II
Multiple regression; analysis of variance; design and analysis of single factor and multifactor experiments; nonparametric methods. Prerequisite: C03 or equivalent.

738-C40-0  Field Project Methods
Examination of bases for theories and practices in organizational behavior and complex systems problem solving. Methods of identifying and defining problems, choosing among methods of data collection and analysis, and designing and carrying out inquiries and related projects. Prerequisite: Non-majors need consent of instructor.

Change course descriptions:

738-C02-0  Probability
738-C19-0  Operations Research
Add:  Not open to IE undergraduate majors.

738-C33-0  Systems Engineering and Analysis
Delete:  May not receive credit for C33 and C34-1.  Add:  Not open to IE undergraduate majors.

738-C36-1,2  Industrial Engineering Design Project I, II
In first sentence, change "decisions" to "decision."

Delete 738-B02-0  Mathematical Modeling.

Add:

738-C01-0  Introduction to Statistics
Collecting data; summarizing and displaying data; drawing conclusions from data; probability background, confidence intervals, hypotheses tests, regression, correlation. Not open to IE undergraduate majors.

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Under Courses Primarily for Undergraduates, add:

750-C33-0 Composite Materials
Introduction to ceramic-, metal-, and polymer-matrix composites for structural applications. Emphasis on structure (reinforcements, architecture), properties (elasticity, strength, toughness, creep), processing, role of interface.


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Under Curriculum, Basic Sciences, replace "Phys A35-1,2 General Physics" with "Phys A35-1,2,3 General Physics."

Under Computer Programming, add: "EECS A01 is recommended."

Under Departmental Program, Options, General Option and Biomedical Engineering Option, replace "ME C98 Engineering Design Project" with "ME C98 Engineering Design."

Replace Intelligent mechanical systems option section with:

In satisfying the departmental computer programming requirement, EECS A10 is recommended instead of EECS A01.

One design course:
ME C98 Engineering Design

Three required courses:
EECS B30 Programming Techniques - PASCAL
EECS C11 Data Structures and Data Management
EECS C16 Mini-microcomputers and Real-time Applications

Two C-level technical electives are required; The following are suggested:
ME C65 Computer-Aided Engineering I - Analysis
ME C66 Computer-Aided Engineering II - Design

Under Manufacturing option, replace "Five courses from the following" with "Four courses from the following."

Under Courses Primarily for Undergraduates, change course descriptions:

740-B24-0 Experimental Engineering
Introduction to modern electronics, construction of elementary analog and digital circuits; such as, opto-devices, clocks, function generators, counters, analog to digital conversion, digital to analog conversion, etc. Introduction to modern data acquisition involving temperature measurements, control of stepper motors, transient heat transfer, fluid mechanics and deformation of beams. Prerequisite: ME B20, ME B41, CE B16.

740-C40-1,2 Computer-Integrated Manufacturing
Add: C40-1 Prerequisites: ME B40 and CE B16 or consent of instructor. C40-2 Prerequisite: ME C40-1 or consent of instructor.

740-C91-0 Fundamentals of Control Systems I
Mathematical modeling of automatic control systems. Open loop and closed loop control. Laplace transform techniques and transfer functions. Stability. Root locus technique, Bode plots, Nyquist criterion. Approaches to control system design including PID and lead-lag compensation. Prerequisites: ME C90 or consent of instructor.

740-C92-0 Fundamentals of Control Systems II

Change course title and description:

740-C98-0 Engineering Design
Add: Prerequisite: Senior standing.

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Add to the list of organizations: "Society of Professional Hispanic Engineers."

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Under Degree Requirements, add to the end of paragraph 2: "In addition, courses that fulfill the requirements for a certificate cannot be taken P/N."

Under Performance Instruction for Nonmajors, add to the end of paragraph 1: "Performance instruction is available to qualified nonmajors on a space available basis for .5 credit."

Under Degree Requirements, Bachelor of Arts in Music, Music, replace the Basic Studies section with:

- Musicianship (6 units)
- Large Ensembles (1 unit)
- Aural Skills (1 unit)
- Keyboard Skills (1 unit -- optional)
- Performance study (3-6 units): includes private instruction and related course work on principal instrument or voice. A second year of instruction may be taken.

Replace the heading Bachelor of Music and Bachelor of Music in Music Education with Bachelor of Music. Under this heading, under Music, replace the Basic Studies section with:

- Musicianship (6 units)
- Large Ensembles (2 units)
- Aural Skills (2 units)
- Keyboard Skills (2 units)
- Performance (6 units): includes private instruction and related course work on principal instrument or voice.
Add the following new section:

Bachelor of Music in Music Education  (48 course units)

Music
- Basic Studies
  Musicianship (6 units)
  Large Ensembles (2 units)
  Aural Skills (2 units)
  Keyboard Skills (2 units)
  Performance (6 units): includes private instruction and related course work on principal instrument or voice.
- Specialization (18.83 - 19.93 units)
  Professional Studies Requirement: see specific program and emphasis
 ~Electives (1-2 units)

Nonmusic
- General Education Distribution (10 units)
  Includes one basic or intermediate English composition course; two natural science courses (taken from the Departments of Astronomy, Biology, Chemistry, Geography, Geology, or Physics), one course in U.S. History, one course in American Government and Politics, one course in psychology, one course in aesthetic education, one course in English or Comparative Literature, one physics of sound course and one general education elective.

Under Five-Year Bachelor of Arts and Bachelor of Music and Five Year Bachelor of Science and Bachelor of Music or Bachelor of Arts in Music, Music, Basic Studies, replace "Skills and Ensembles" with:

  Large Ensembles (2 units)
  Aural Skills (2 units)
  Keyboard Skills (2 units)

Delete footnote on page 196.
Under Interdisciplinary Certificate Programs, add the following to the list of current certificate programs:

- Musical Theatre

Certificate in Musical Theatre The Certificate Program in Musical Theatre provides the opportunity for students majoring in Voice (or Theatre) to create a second area of specialization that is crucial to their development as musical theatre artists. For the Voice major the program provides for actor-training and other much needed theatre courses.

The Certificate Program is also geared for students who are interested in the related arts of the lyric theatre -- namely choreographers and dancers, composers, and lyricists, and directors of opera and musical comedies. The required course work for the performer is of equal value to students who are planning a career in a related field, or simply wish to deepen their knowledge and appreciation of opera, dance and the musical.

Only students who have been accepted into the Program may enroll in the sequence of courses. Auditions are held annually in the Spring Quarter for Theatre and Voice majors wishing to be admitted to the Certificate Program. Only freshmen and sophomores may audition. Auditioners are required to perform a vocal selection, a monologue, and to participate in a dance audition.

Music Theatre Certificate Requirements for Music Majors:
- 630-B43-1,2,3 Principles of Characterization 3 units
- 630-C76-0 History of the Lyric Theatre 1 unit
- 630-C55-1,2 Music Theatre Techniques I, II 2 units
- 630-A19-0 Production Lab (one quarter) 0 units
- Design or Dance elective 1 unit
- Three quarters of Dance Class 0 units

7 units

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This department consists of the following programs: Church Music and Organ, Conducting, Piano, Strings, Winds and Percussion, and Voice and Opera.

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This department consists of the following programs: Music Education, Music History and Literature, Music Theory, and Composition.

A Bachelor of Music specialization in Academic Studies and Composition has the following requirements:
- 12 units of specialization, to be taken from courses approved by the Department of Academic Studies and Composition.
- 3 of the 12 specialization units are required to be taken from a short list of courses approved by the Department (see Department Chair).
- Students admitted to this specialization may elect a "concentration" in an area of study approved by the Department. Nine units of specialization (excluding the 3 units mentioned above) are required to be taken from a list for that concentration approved by the Department (see Department Chair).

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Under Courses Open to Undergraduates:

Delete 500-A25-0, B25-0 and C25-0 Skills and Ensembles.

Change:

500-A26-0  Aural Skills (0) to 500-A26-1,2,3  Aural Skills I, II, III  (.33). Delete: "Credit through A25."

500-A27-0  Keyboard Skills (0) to 500-A27-0  Keyboard Skills (.33). Delete: "Credit through A25."

500-B26-0  Aural Skills (0) to 500-B26-1,2,3  Aural Skills IV, V, VI  (.33). Delete: "Credit through B25."

500-B27-0  Keyboard Skills (0) to 500-B27-0  Keyboard Skills (.33).
Delete: "Credit through B25."

For 500-B64-0, B68-0, B74-0, B77-0, and B93-0, change credit to .33.
Delete: "Music students register for credit through A25, B25, or C25."

Add:

500-B61-0  Jazz Keyboard Studies I

500-C27-1  Advanced Keyboard Skills VII  (.33)
Advanced score reading. Continues skills development begun
in Level VI with three- and four-part choral scores. Students gain additional experience reading various voice parts in combination (SA, STB, etc.) and harmonically reducing four-part textures.

500-C27-2  Advanced Keyboard Skills VIII  (.33)
Emphasis on techniques of accompanying, "how to" class includes reducing and rewriting accompaniments to make initial performances more effective. Students work with both prepared accompaniments and at sight materials.

500-C27-3  Advanced Keyboard Skills IX  (.33)
Advanced accompanying. Emphasis on adding accompaniments to a given vocal line. Experience with improvising accompaniments in various styles including "swing." Also includes transposition of individual lines.

500-C61-0  Jazz Keyboard Studies II
500-C64-0  Choral Organizations  (.5)
500-C68-0  Chapel Choir  (.5)
500-C74-0  Band Organizations  (.5)
500-C77-0  Jazz Ensembles  (.5)

500-C89-0  Convocation  (0)
Attendance at the five School of Music Convocations held each quarter.

500-C93-0  Orchestral Organizations  (.5)

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Under Courses Open to Undergraduates, add:

501-A75-0  Selected Topics in Music For non-music majors.

Under 501-B53-0  Form and Analysis, delete "(II. Formal Studies)."

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Under Professional Studies Requirement, add: "Six quarters of 500-C89-0 Convocation are required."

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Graduates with a major in music education meet all requirements for teacher certification in the state of Illinois as well as most other states. Students take the core program required of all music students, a structured sequence of courses in general education, a basic set of courses in music education, and special courses in the chosen music education specialization. The combination results in a program that prepares professionals with a broad understanding of music and education as well as the skills to be effective music teachers.

Requirements for students graduating in June, 1994 and after:

**Basic Studies Requirement (18 units)**

**General Education Requirement (10 units)**
- Basic Composition (0419 Eng A05-0 or 0419 Eng B05-0)
- Distribution Area I -- Natural Science (2 units from the Departments of Chemistry, Biology, Geology, Astronomy, Physics, or Geography)
- U.S. History (may not be taken P/N)
- American Government & Politics (may not be taken P/N)
- 0451-A10-0 Introduction to Psychology
- Aesthetic Education (0205 EdPr C03-0)
- Distribution Area VI (must be from the Departments of English or Comparative Literature)
- General Education Elective
- 0447 Physics of Sound (lab science)

**Instrumental Emphasis**

**Professional Studies Requirement (19.83 units)**
- 0525-B59-0  Introduction to Technology for Music Educators
- 0525-B60-0  Music Teacher as Communicator
- 0525-B79-1,2,3  Clinical Experience
- 0525-C79-1,2,3  Clinical Experience
- 0540-C26-0  Conducting and Score Reading
- 0225-C01-0  Human Development: Childhood and Adolescence
- 0205-C27  Problems of the Exceptional Child or 0624-C36-0

The Field of Special Education
- 0525-C63-0  HS Non-Performance Classes
- 0525-C64-0  Teaching Instrumental Music I
- 0525-C65-0  Teaching Instrumental Music II
- 0525-C68-0  Teaching Composition in the Schools
- 0525-C69-0  Research and Evaluation in Music Education
- Class Instruments (7 classes: Violin, Strings, Clarinet, Woodwinds, Trumpet, Brass, Percussion)
- Student Teaching (C80-C87)  3 units and 2 levels required
- Physical Education (3 quarters required, 1 may be NUMB)
- Ensembles (5 quarters required; Wind and Percussion students must take at least 1 NUMB)

Electives
- Free elective (1 unit)

Students are encouraged to take additional music and free electives if their schedule permits.

Choral Emphasis

Professional Studies Requirement  (18.83 units)
- 0525-B59-0  Introduction to Technology for Music Educators
- 0525-B60-0  Music Teacher as Communicator
- 0525-B79-1,2,3  Clinical Experience
- 0525-C79-1,2,3  Clinical Experience
- 0540-C26-0  Conducting and Score Reading
- 0225-C01-0  Human Development: Childhood and Adolescence
- 0205-C27  Problems of the Exceptional Child or 0624-C36-0

The Field of Special Education
- 0525-C63-0  HS Non-Performance Classes
- 0525-C66-0  Teaching Choral Music I
- 0525 C67-0  Teaching Choral Music II
- 0525 C68-0  Teaching Composition in the Schools
- 0525 C69-0  Research and Evaluation in Music Education
- Student Teaching (C80-C87)  3 units and 2 levels required
- Physical Education (3 quarters required, 1 may be NUMB)
- Ensembles (5 quarters required)

- Additional Skills:
  Keyboard Skills C27-1, 2, 3
  0525-B32-0 Voice Class

Electives
- Free electives (2 units)
Students are encouraged to take additional music and free electives if their schedule permits.

General Music Emphasis

Professional Studies Requirement (18.83 units)
0525-B59-0 Introduction to Technology for Music Educators
0525-B60-0 Music Teacher as Communicator
0525-B79-1,2,3 Clinical Experience
0525-C79-1,2,3 Clinical Experience
0540-C26-0 Conducting and Score Reading
0225-C01-0 Human Development: Childhood and Adolescence
0205-C27 Problems of the Exceptional Child or 0624-C36-0

The Field of Special Education
0525-C61-0 Teaching General Music I
0525-C62-0 Teaching General Music II
0525-C63-0 HS Non-Performance Classes
0525-C68-0 Teaching Composition in the Schools
0525-C69-0 Research and Evaluation in Music Education

Class Instruments (4 classes: Guitar I, Guitar II, Recorder, Voice)

Student Teaching (C80-C87) 3 units and 2 levels required

Physical Education (3 quarters required, 1 may be NUMB)
Ensembles (5 quarters required)

Electives
Free electives (2 units)
Students are encouraged to take additional music and free electives if their schedule permits.

Courses
0525-B31-1,2 Guitar Class I, II (.33)
0525-B32-0  Voice Class (.33)

0525-B33-0  Clarinet Class (.33)

0525-B34-0  Woodwinds Class (.33)
An exploration of the performance characteristics and pedagogical strategies most strongly associated with teaching flute, saxophone, oboe, and bassoon to beginning and intermediate instrumentalists. Prerequisite: 0525-B33-0 Clarinet Class.

0525-B35-0  Trumpet Class (.33)

0525-B36-0  Brass Class (.33)
An exploration of the performance characteristics and pedagogical strategies most strongly associated with teaching horn, trombone, euphonium, and tuba to beginning and intermediate instrumentalists. Prerequisite: 0525-B35-0 Trumpet Class.

0525-B37-0  Violin Class (.33)

0525-B38-0  Strings Class (.33)
An exploration of the performance characteristics and pedagogical strategies most strongly associated with teaching viola, cello, and string bass to beginning and intermediate instrumentalists. Prerequisite: 0525-B37-0 Violin Class.

0525-B39-0  Percussion Class (.33)

0525-B40-0  Recorder Class (.33)

0525-B41-0  Guitar Techniques (.33)

0525-B59-0  Introduction to Technology for Music Educators
Survey of commercial software for music teaching, composing, and personal productivity. Introduction to multimedia, including HyperCard scripting, CD ROM, and video laserdisk. MIDI applications will be included.
0525-B60-0  The Music Teacher as Communicator
For all students considering a specialization in music education. Discussion and observation of school music programs and effective presentational skills.

0525-B79-1,2,3  Clinical Experience I (.33 each)
Field placement - 2 hours weekly. Sophomores: Fall - Elementary; Winter - Junior High; Spring - High School. One-hour seminar meets alternate weeks.

0205-C03-0  Problems in the Philosophy of Education:
Aesthetic Education
Underlying issues in teaching and learning. Jointly with School of Education and Social Policy. (V. Values)

0525-C40-0  Selected Topics in Music Education
Topics vary; announced before registration. May be repeated.

0525-C41-0  Professional Practicum
For Master of Music in Music Education students. Field work and related experiences leading to a teaching demonstration. Not open to undergraduates.

0525-C61-0  Teaching General Music I
Curriculum materials and strategies for developing musical growth. Laboratory experiences; developing creativity in the music classroom. Open only to music majors or with consent of instructor.

0525-C62-0  Teaching General Music II
Effective teaching of general music classes. Available curriculum materials; innovative approaches.

0525-C63-0  Teaching High School Nonperformance Courses
Planning and teaching high school music, arts, humanities courses. Present practices; development of exemplary course plans.

0525-C64-0  Teaching Instrumental Music I
Development and application of the teaching and administrative principles through which public school
instrumental music programs can prosper. Special attention is given to rehearsal dynamics, conducting, rehearsal room management, and pedagogy for secondary school instrumentalists.

0525-C65-0  Teaching Instrumental Music II
Application of teaching concepts consistent with aesthetic education to the instrumental music program. Special attention is given to jazz pedagogy and pedagogy for young instrumentalists. Prerequisite: 0525-C64-0.

0525-C66-0  Teaching Choral Music I

0525-C67-0  Teaching Choral Music II
Further development of skills, knowledge and understandings developed in Teaching Choral Music I. Focus in the high school choral program curriculum model, repertoire, sightreading, rehearsal techniques, programming, administration.

0525-C68-0  Teaching Composition in the Schools
Review of the practical and research literature in teaching composition in the schoolroom. Design of curricular materials for teaching sequences dealing with composition. Use of hardware and software in school settings.

0525-C69-0  Research and Evaluation in Music Education
Introduction to the various procedures and issues associated with excellence in research and evaluation in music teaching. Emphasis on practical application of a variety of research findings to decision making in music teaching and learning.

0525-C79-1,2,3  Clinical Experience II (.33 each)
Field placement - 2 hours weekly. Juniors: Fall - student's choice; Winter/Spring - correlated with Methods courses. Seminar meets alternate weeks.

0525-C99-0  Independent Study

Student Teaching
Students are assigned to specific classes in cooperating schools under joint university/school supervision.

0525-C80-0  Student Teaching in the Elementary School: General Music (1-4 units)

0525-C81-0  Student Teaching in the Middle School/Junior High School: General Music, Choral (1-4 units)

0525-C83-0  Student Teaching in the Senior High School: Choral and Nonperformance Courses (1-4 units)

0525-C85-0  Student Teaching in the Elementary School: Instrumental (1-4 units)

0525-C86-0  Student Teaching in the Middle School/Junior High School: Instrumental (1-4 units)

0525-C87-0  Student Teaching in the Senior High School: Instrumental and Nonperformance Courses (1-4 units)

D-Level Courses

Courses at the D level are primarily for graduate students but may be open to advanced undergraduate students with permission. For descriptions of graduate courses and programs, see the appropriate graduate publication.

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Replace second, third and fourth sentences of the introductory paragraph with: "A major is possible within the framework of the bachelor of music in Academic Studies and Composition. Courses are selected in consultation with music history and literature faculty."

Under Courses Open to Undergraduates, change credit for 530-B99-0 Early Music Ensemble to .33.

Add:

530-C99-0 Early Music Ensemble (.5)

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Conducting

Under Courses Open to Undergraduates, delete 525-B75-0 Teaching Instrumental Music.

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Under Professional Studies Requirement, add: "Six quarters of 500-C89-0 Convocation are required."

Under Courses Open to Undergraduates, delete 555-B28-0 Accompanying.

Add:

555-C28-0 Accompanying/Recital Preparation (.5)
This course will involve piano students in a working relationship with a singer and instrumentalist in the preparation and performance of main-stream repertoire for piano-voice and piano plus one instrument. Performers will be coached in weekly two-hour classes.

555-C91-0 Advanced Chamber Music (.5)
For juniors and seniors.

555-D52-0 Advanced Accompanying/Recital Preparation (.5)
This course will continue with pianists and their partners being coached for performance in the advanced repertoire for the above, in weekly two-hour classes.

Change credit for 555-B30-0, D53-0, D53-3, D54-0, D55-0, D56-0, D57-0, D58-0, D58-1, D59-0, D60-0 and D60-1 to .5.

Delete:

555-C50-0 Modules in Piano Performance
555-D51-0 Accompanying
555-D52-0 Recital Preparation
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Under Degree Requirements, add to the end of paragraph 2: "In addition, courses that fulfill the requirements for a certificate cannot be taken P/N."

Under Performance Instruction for Nonmajors, add to the end of paragraph 1: "Performance instruction is available to qualified nonmajors on a space available basis for .5 credit."

Under Degree Requirements, Bachelor of Arts in Music, Music, replace the Basic Studies section with:

- Musicianship (6 units)
- Large Ensembles (1 unit)
- Aural Skills (1 unit)
- Keyboard Skills (1 unit -- optional)

Performance study (3-6 units): includes private instruction and related course work on principal instrument or voice. A second year of instruction may be taken.

Replace the heading Bachelor of Music and Bachelor of Music in Music Education with Bachelor of Music. Under this heading, under Music, replace the Basic Studies section with:

- Musicianship (6 units)
- Large Ensembles (2 units)
- Aural Skills (2 units)
- Keyboard Skills (2 units)

Performance (6 units): includes private instruction and related course work on principal instrument or voice.
Add the following new section:

Bachelor of Music in Music Education  (48 course units)

Music
- Basic Studies
  Musicianship (6 units)
  Large Ensembles (2 units)
  Aural Skills (2 units)
  Keyboard Skills (2 units)
  Performance (6 units): includes private instruction and related course work on principal instrument or voice.
- Specialization (18.83 - 19.93 units)
  Professional Studies Requirement: see specific program and emphasis
  ~Electives (1-2 units)

Nonmusic
- General Education Distribution (10 units)
  Includes one basic or intermediate English composition course; two natural science courses (taken from the Departments of Astronomy, Biology, Chemistry, Geography, Geology, or Physics), one course in U.S. History, one course in American Government and Politics, one course in psychology, one course in aesthetic education, one course in English or Comparative Literature, one physics of sound course and one general education elective.

Under Five-Year Bachelor of Arts and Bachelor of Music and Five Year Bachelor of Science and Bachelor of Music or Bachelor of Arts in Music, Music, Basic Studies, replace "Skills and Ensembles" with:

  Large Ensembles (2 units)
  Aural Skills (2 units)
  Keyboard Skills (2 units)

Delete footnote on page 196.
Under Interdisciplinary Certificate Programs, add the following to the list of current certificate programs:

- Musical Theatre

After Certificate in Music Criticism section, add:

Certificate in Musical Theatre The Certificate Program in Musical Theatre provides the opportunity for students majoring in Voice (or Theatre) to create a second area of specialization that is crucial to their development as musical theatre artists. For the Voice major the program provides for actor-training and other much needed theatre courses.

The Certificate Program is also geared for students who are interested in the related arts of the lyric theatre -- namely choreographers and dancers, composers, and lyricists, and directors of opera and musical comedies. The required course work for the performer is of equal value to students who are planning a career in a related field, or simply wish to deepen their knowledge and appreciation of opera, dance and the musical.

Only students who have been accepted into the Program may enroll in the sequence of courses. Auditions are held annually in the Spring Quarter for Theatre and Voice majors wishing to be admitted to the Certificate Program. Only freshmen and sophomores may audition. Auditioners are required to perform a vocal selection, a monologue, and to participate in a dance audition.

Music Theatre Certificate Requirements for Music Majors:
- 630-B43-1,2,3 Principles of Characterization 3 units
- 630-C76-0 History of the Lyric Theatre 1 unit
- 630-C55-1,2 Music Theatre Techniques I, II 2 units
- 630-A19-0 Production Lab (one quarter) 0 units
- Design or Dance elective  
  1 unit  
- Three quarters of Dance Class  
  0 units  

7 units

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Last Updated: Dec. 13, 1991
Under Professional Studies Requirement:
Delete: 500-C25 Skills and Ensembles (6 units)
Add: Six quarters of large ensembles (3 units)
       Six quarters of small ensembles (3 units)
       Six quarters of 500-C89-0 Convocation

Under Courses Open to Undergraduates, change credit for
565-B91-0 Chamber Music to .33.
Delete: "Included in 500-A25, B25, C25."

Change credit for 565-C51-0, C52-0, C53-0, C54-0, C55-0, C56-0,
C57-0 and C59-0 to .33.

Change course title and credit: 565-C91-0 Advanced Chamber
Music (.5). Delete: "May be included in 500-B25 and C25
for credit."

Delete 565-C50-0 Modules in Winds and Percussion
Performance.

Add:

565-C48-0 Recital Preparation
This course will give instrumentalists the opportunity for an
ongoing working partnership with a pianist. Class members
will be scheduled for frequent coaching times in class, in
preparation for their recital and other performances.
Auditors for non-credit will be admitted.

565-D48-0 Advanced Recital Preparation
This course will continue to offer instrumentalists a strong
working relationship with a pianist. Class members will be
scheduled for frequent coaching times in class, in
preparation for their recitals and other performances. Auditors for non-credit will be admitted.

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Voice and Opera

Under Professional Studies Requirement

add:

"Six quarters of 500-C89-0 Convocation are required."

Under Courses Open to Undergraduates, change credit for 570-A02-0 Beginning Voice to (.5).

Change credit for 570-A11-1,2,3 Phonetics and Diction to 0 (zero).

Change credit for 570-D51-0, D52-0, D53-0, D54-0, D55-0, D56-0, D57-0 and D58-0 to .5.

Delete 570-D50-0 Modules in Voice Performance.

Add:

570-A09-0 Voice Performance -- Musical Theatre (.5)
Private applied music in voice for theatre majors seeking a Music Theatre Certificate. Prerequisite: Admission to Music Theatre Certificate Program and completion of 570-A02-0 or equivalent.

570-C48-0 Recital Preparation
This course will give singers the opportunity for an ongoing working partnership with a pianist. Class members will be scheduled for frequent coaching times in class, in preparation for their recital and other performances. Auditors for non-credit will be admitted.

570-C91-0 Advanced Chamber Music (.5)
For juniors and seniors.

570-D48-0  Advanced Recital Preparation
This course will continue to offer singers a strong working relationship with a pianist. Class members will be scheduled for frequent coaching times in class, in preparation for their recitals and other performances. Auditors for non-credit will be admitted.

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Replace first and second sentences of introductory paragraph with: "A major is possible within the framework of the bachelor of music in Academic Studies and Composition. Majors take a program designed to develop analytic and/or creative skills. Specialization courses are selected in consultation with theory or composition faculty."

Delete entire Professional Studies Requirement section.

Under Courses Open to Undergraduates, change credit for 535-B78-0 Contemporary Music Ensemble to .33.

Add:

535-C51-0 Music Cognition
An overview of the foundations, literature, and methods of research into music cognition. Readings from primary and secondary sources; small experimental projects based on typical paradigms. No prerequisite, although a previous course in psychology is beneficial.

535-C52-0 Score Analysis Skills
"Speed-reading" of score for the discovery of harmonic and tonal content. Consideration of the expressive significance of resultant tonal profiles. Regular quizzes and drills (in and out of the Computer Lab).

535-C53-0 The Theories of Heinrich Schenker
Overview of Schenker's theories of music and methods of musical analysis. Readings from primary and secondary sources; analysis of short musical works.
535-C54-0  Music Perception
Survey of the literature and methods of research in the
perception of musical sound.

535-C78-0  Contemporary Music Ensemble  (.5)

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Replace all textual occurrences of "audiology and hearing impairment" with "audiology and hearing sciences."

Replace the heading Audiology and Hearing Impairment with Audiology and Hearing Sciences. Under this heading, replace the last sentence of the first paragraph with: "An introduction to audiologic assessment and habilitation/rehabilitation of hearing-impaired persons is provided, with the opportunity for supervised clinical experience for advanced undergraduate students."

Under Learning Disabilities, replace the second sentence of the first paragraph with: "The field is concerned with learning processes and their dysfunctions, including disorders of attention, perception, memory, language, and conceptualization."

Replace first sentence of second paragraph with: "Learning disabilities specialists who have completed the M.A. degree and certification may work in public or private schools, universities, hospitals, or community clinical facilities."

Delete the final sentence of the second paragraph.

Under Requirements for a Major in Communication Sciences and Disorders, delete the words "and hearing impairment" from the third item (C- and D-level courses..."

Add the following between the third and fourth items:

With approval of their advisors and the Associate Dean, students may petition to replace some of the departmental A- and B-level courses with more advanced courses within the
Replace the heading Audiology and Hearing Impairment with Audiology and Hearing Sciences.

Under Courses for Undergraduates and Graduates, add:

621-C18-0  Introduction to Audiology and Hearing Sciences
The purpose of this course is to understand the hearing mechanism, the components of sound, and how hearing is measured in humans. It serves as an introduction to audiology—specifically audiologic assessment.

Under Learning Disabilities, Courses Primarily for Undergraduates, change course description:

623-C78-1,2  Supervised Teaching in Learning Disabilities
Delete "psychoneurological" from first sentence.

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Under Speech and Language Pathology, delete:

624-C40-1,2  School Practicum in Speech and Language Pathology
624-C41-1,2  School Practicum in Speech and Language Pathology

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605-C07-1,2  Studies in Gender and Performance
The social and political background of gender, particularly women's access to performative expressions.  1. Women in the interstices of culture.  2. Feminist critiques of performance and production in the contemporary context.  (Also see Theatre 630-C07-0.)

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Under Courses Primarily for Juniors, Seniors, and Graduates, add:

630-C07-0  Studies in Gender and Performance
The social and political background of gender, particularly women's access to performative expressions. Debates on women's participation in the public theatre. (Also see Performance Studies 605-C07-1,2.)

630-C38-0  Theatre Practicum  (1 or 2)

630-C39-0  Advanced Acting

630-C55-0  Scene Painting
Advanced study in scenic artists' techniques and procedures. Projects in color use for the stage. Work will follow approaches established by professional scenic artists. Lab fee for materials. Must supply own brushes.

630-C68-0  African Theatre and Drama
Examines festival practices, traveling and popular theatres, drama in English and the development of appropriate critical terminology.

Change course numbers:

630-C55-1,2  Music Theatre Techniques to C52-1,2.
630-C65-0  American Theatre and Drama to C65-1,2 (now a 2-part course).
630-C75-0  Dance in Education to C71-0.

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Under Program of Study, Core electives, second item, change "History and Literature of Religions" to "Religion."

Replace third item with:

Approaches to International Ethics and Cooperation:

Replace "Senior seminar, capstone course, or research project" heading with "Senior seminar or research project."

Under Courses, change course description:

495-B01-1,2,3 Introduction to the World System
A year-long sequence investigating the origins and nature of contemporary global economic, political, and cultural interdependence. The first two quarters concern the transformations that have made the modern world, with focus on globalizing processes of change in societies, economies, cultures, states, environments, and knowledge. The third quarter highlights twentieth-century issues. 1. Economic and political organization of space and power in a world newly linked by travel, conquest, and trade. 2. The global revolutions of economies, technologies, states, and populations. 3. The contemporary international system: the emergence of east-west and north-south cleavages.

Add:
International Ethics
An investigation, using classic texts, of what constitutes a "good" foreign policy. This course was given as International Studies B01-3 in the academic years 1989-90, 1990-91 and 1991-92. The course is required for International Studies majors who did not take it as International Studies B01-3. For such students the course fulfills the requirement in "International Ethics and Cooperation," which, for them, replaces the former requirement of "The United States and the World."

Topics in International Studies
Advanced seminars on topics international in scope. Course may be repeated as content varies. Prerequisite: permission of instructor.

Lectures in International Studies
Lecture courses on topics international in scope. Course may be repeated as content varies. Prerequisite: permission of instructor.

Independent Research
Advanced research carried out under the supervision of a professor in a department related to the area of study. Only one quarter may count toward the requirements of the adjunct major. Only with approval of the Director of the Undergraduate Major, following submission of a written proposal.

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