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Calendar

Summer Session, 1964

First Term

Registration for the first term	June 3-4
Instruction begins at 7:20 A.M.	June 5
Only day to change sections or add courses	June 8
Last day to drop a course with grade of W	June 18
Independence Day—a College holiday	July 4
Last day to drop a course	July 6
Final examinations for the first term	July 9-10

Second Term

Registration for the second term	July 13-14
Instruction begins at 7:20 A.M.	July 15
Only day to change sections or add courses	July 17
Last day to drop a course with grade of W	July 28
Last day to drop a course	Aug. 6
Last day to submit reports, theses, and dissertations to the Graduate Dean	Aug. 12
Final examinations for the second term	Aug. 19-20
Commencement	Aug. 22

Long Session, 1964 - 1965

Fall Semester, 1964

Registration for the fall semester	Sept. 15-17
Instruction begins at 8 A.M.	Sept. 18
Only day to change sections or add courses	Sept. 23
Last day to drop a course with grade of W	Oct. 19
Thanksgiving Vacation	
Instruction ends at 10 P.M.	Nov. 25
Instruction resumes at 8 A.M.	Nov. 30
Christmas Vacation	
Instruction ends at 12 Noon	Dec. 19
Instruction resumes at 8 A.M.	Jan. 4
Last day to drop a course	Jan. 5
Final examinations for the fall semester	Jan. 15-22

Spring Semester, 1965

Registration for the spring semester	Jan. 26-28
Instruction begins at 8 A.M.	Jan. 29
Only day to change sections or add courses	Feb. 2
Last day to drop a course with grade of W	March 1
Spring Vacation	
Instruction ends at 12 Noon	March 27
Instruction resumes at 8 A.M.	April 5
Last day to drop a course	May 3
Last day to submit reports, theses, and dissertations to the Graduate Dean	May 20
Final examinations for the spring semester	May 19-26
Commencement	May 29

Administrative Officials and Faculty

Board of Directors 1964 - 1965

Officers

MANUEL DeBUSK, Chairman
WILMER SMITH, Vice Chairman
J. ROY WELLS, Secretary

Members of the Board

Term Expires February 19, 1965

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CHARLES D. MATHEWS Dallas
WILMER SMITH Wilson

Term Expires February 19, 1967

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R. WRIGHT ARMSTRONG Fort Worth
J. EDD McLAUGHLIN Ralls

Term Expires February 19, 1969

HERBERT ALLEN Houston
ROY FURR Lubbock
HAROLD HINN Dallas and Plainview

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WILLIAM MARTIN PEARCE, Ph.D., Vice President for Academic Affairs
MARSHALL LEE PENNINGTON, B.B.A., Vice President for Business Affairs
WILLIAM HENRY BUTTERFIELD, M.A., Vice President for Development
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JOHN ROSS BRADFORD, Ph.D., Dean of Engineering
WILLIAM M. BROWN, B.S., Colonel, U.S. Army, Professor of Military Science
GEORGE GAIL HEATHER, Ph.D., Dean of Business Administration
GEORGE R. HULL, M.A., Lieutenant Colonel, U.S. Air Force, Professor of Air Science
RAY CURTIS JANEWAY, M.S., Librarian
JEAN AYRES JENKINS, B.A., Director of The Placement Service
LEWIS NORTEN JONES, M.A., Dean of Men
SABE McCLAIN KENNEDY, Ph.D., Dean of Arts and Sciences
JACOB HOMER MILLIKIN, M.A., Director of Extension and Correspondence
GUY JUNIOR MOORE, M.S., Director of Residence Halls
(Appointed Oct. 1, 1963)

FLORENCE LOUISE PHILLIPS, Ed.D., Dean of Women
ROBERT BYRON PRICE, M.B.A., C.P.A., Comptroller
FRED DURNFORD RIGBY, Ph.D., Dean of the Graduate School
ELVIS DEAN SMITH, M.B.A., Purchasing Agent
JOHN GATES TAYLOR, Business Manager

GERALD WAYLETT THOMAS, Ph.D., Dean of Agriculture

(On leave Feb. 10 through Aug. 31, 1964)

WILLA VAUGHN TINSLEY, Ph.D., Dean of Home Economics

CLAUDE ADRIAN VAUGHAN, M.J., Director of Public Information

FREDRIC JOHN WEHMEYER, B.B.A., Director of Classified Personnel

JAMES WAYLAND BENNETT, Ph.D., Associate Dean of Agriculture

MARGARET RAGSDALE BIRKMAN, B.S., Assistant Director of Food Service,
Residence Halls

ROGER LEON BROOKS, Ph.D., Associate Dean of the Graduate School

(Appointed Feb. 1, 1964)

FLORENCE EVELYN CLEWELL, B.A., Assistant Registrar

JESSE EARL CRAWFORD, B.S., Central Stores and Property Manager

GEORGE O. ELLE, Ph.D., Assistant Dean of Agriculture

(Appointed Feb. 10, 1964)

DOROTHY TAFT GARNER, M.A., Assistant Dean of Women in Charge of Residence
Hall Supervision for Women

IVAN LEE LITTLE, Ph.D., Associate Dean of Arts and Sciences

ANGELA CAROL MALOUF, B.B.A., Assistant Director of The Placement Service

D. M. McELROY, Director of Educational Television

DOYLE G. MUNKRES, B.B.A., Internal Auditor

ROBERT LEE NEWELL, M.S., Assistant Dean of Engineering

JACQUELINE ISABEL OLSEN, M.S. in Ed., Assistant Dean of Women

JAMES EDWARD PLATZ, B.S. in L.S., Associate Librarian

HARVEY PAT POWER, B.B.A., Assistant Purchasing Agent

JOHN HAYES REESE, LL.B., Assistant Dean of Business Administration

DONALD LEE RENNER, B.B.A., Assistant Dean of Admissions and Assistant Registrar

HOLLIS ROYCE SMITH, B.B.A., Chief Accountant

VIRGINIA LEE SNELLING, B.A., Head of the Payroll Department and Employee
Benefits

THOMAS PAUL STOVER, M.S., Adviser to the Fraternities, to Foreign Students, and
on Financial Aids

JAMES RICHARD TARTER, M.S., Assistant Registrar in Charge of Admissions

FRANK MILLETT TEMPLE, M.A., Associate Librarian

WELBORN KEIFER WILLINGHAM, M.Ed., Assistant Dean of Men in Charge of
Residence Hall Supervision for Men

Emeritus Officers of Administration and Graduate Professors

CLIFFORD BARTLETT JONES, LL.D., President Emeritus

WARREN PERRY CLEMENT, M.A., Registrar Emeritus

SETH THOMAS CUMMINGS, Purchasing Agent Emeritus

(Deceased Nov. 2, 1963)

WILLIAM THOMAS GASTON, Business Manager Emeritus

WENZEL LOUIS STANGEL, M.S., LL.D., Dean Emeritus of Agriculture

MARGARET WATSON WEEKS, M.S., Dean Emeritus of Home Economics

OTTO VINCENT ADAMS, M.S.E., D.Sc., Civil Engineering (Dean of Engineering
1932-1949)

WILLIAM BRYAN GATES, Ph.D., Dean Emeritus of the Graduate School

VIVIAN JOHNSON ADAMS, M.A., Home Economics Education

LOUISE CRAWFORD ALLEN, M.A., Journalism

CHARLES VICTOR BULLEN, M.S. in E.E., Electrical Engineering

WILLIAM MOORE CRAIG, Ph.D., Chemistry

CHARLES DUDLEY EAVES, Ph.D., History
 MABEL DEANE ERWIN, M.A., Clothing and Textiles
 EUNICE JOINER GATES, Ph.D., Foreign Languages
 CARL HENNINGER, M.A., Foreign Languages
 CECIL HORNE, B.A., Journalism
 JOHNNY GILKERSON LANGFORD, M.A., Physical Education
 JONNIE McCRERY MICHIE, M.A., Food and Nutrition
 RUFUS ARTHUR MILLS, M.A., English
 JAMES HAROLD MURDOUGH, M.S.E., Civil Engineering
 ANNAH JOE PENDLETON, M.A., Speech
 CHARLES BLAISE QUALIA, Ph.D., Foreign Languages
 OSCAR ALLEN St. CLAIR, B.S. in E.E., Industrial Engineering
 WILLIAM MACKEY SLAGLE, M.A., Chemistry
 FRED WINCHELL SPARKS, Ph.D., Mathematics
 ALAN LANG STROUT, Ph.D., English
 EARL L. THOMPSON, Ph.D., Mathematics
 RALPH SYLVESTER UNDERWOOD, Ph.D., Mathematics
 THOMAS FERDINAND WIESEN, M.B.A., Economics
 WARREN WATSON YOCUM, Ph.D., Horticulture

Graduate Council

The Graduate Council is composed of ten members, eight of whom are elected by the Graduate Faculty and two of whom are appointed by the Dean, who is *ex officio* chairman of the Council. Members serve for a period of three years and are not eligible for immediate re-election unless they have been chosen to fill an unexpired term. By a system of rotation, some new members join the Council each year, replacing those whose terms of office have expired. The date after a name indicates the year of expiration of the individual's term of office.

The Graduate Council, assisted by the Graduate Faculty, is charged with the responsibility of formulating the policies of the Graduate School and the requirements for graduate degrees. These policies are administered by the Dean.

FRED DURNFORD RIGBY, Ph.D., Professor of Mathematics and Dean of the Graduate School, Chairman

THEODORE ANDREYCHUK, Ph.D., Professor and Head of the Department of Psychology (1965)*
 DONALD ASHDOWN, Ph.D., Professor of Horticulture and Park Management (1965)
 ROGER LEON BROOKS, Ph.D., Professor of English and Associate Dean of the Graduate School (1966)**
 LAWRENCE LESTER GRAVES, Ph.D., Professor of History (1964)
 DONALD JACOB HELMERS, M.S., Associate Professor of Mechanical Engineering (1965)
 LESTER SAMUEL LEVY, Ph.D., Professor of Economics (1966)
 BILLY CLARENCE LOCKHART, D.Ed., Professor and Head of the Department of Applied Arts (1964)
 LEVI MARSHALL NAGLE, JR., Ed.D., Associate Professor of Education (1965)
 BILLY JOE SANDLIN, Ph.D., Associate Professor of Physics (1965)
 FRANKLIN ALTON WADE, Ph.D., Professor and Head of the Department of Geosciences (1964)*

* Appointed Members

** Appointed Associate Dean Feb. 1, 1964

Office of the Dean of the Graduate School

251 Administration Building

FRED D. RIGBY, Dean

ROGER L. BROOKS, Associate Dean
(Appointed Feb. 1, 1964)

MRS. IRENE F. TEMPLE, Administrative Assistant

MISS BILLIE J. RICHARDSON, Secretary II

MRS. SALLY K. SCOTT, Secretary I

Graduate Faculty Members

Members of the Graduate Faculty participate in all phases of the graduate program, assist in determining policy, and vote on candidates for graduate degrees. Membership is conceived of as a means of recognizing the distinguished members of the faculty as evidenced by scholarship, creativity, and direction of graduate research and study.

ROBERT CABANISS GOODWIN, Ph.D., President and Professor of Chemistry
WILLIAM MARTIN PEARCE, Ph.D., Vice President for Academic Affairs and
Professor of History
FLOYD D. BOZE, Ed.D., Dean of Admissions and Registrar
RAY CURTIS JANEWAY, M.S., Librarian

JOE ALFRED ADAMCIK, Ph.D., Associate Professor of Chemistry
JAMES GEORGE ALLEN, M.A., Professor of English and Dean of Student Life
ROBERT PAUL ANDERSON, Ph.D., Part-time Professor of Psychology
THEODORE ANDREYCHUK, Ph.D., Professor and Head of the Department of
Psychology
WILLIAM BURNSIDE ARPER, JR., Ph.D., Professor of Geosciences
DONALD ASHDOWN, Ph.D., Professor of Entomology
CECIL IRVY AYERS, M.S., Professor of Agronomy
ALBERT BARNETT, Ph.D., Professor of Education
NOLAN ELLMORE BARRICK, M.A., Reg. Arch. (Texas), Professor and Head of
the Department of Architecture and Allied Arts and Supervising Architect
MOHAMMED ALI AL-BASSAM, Ph.D., Professor of Mathematics
JAMES WAYLAND BENNETT, Ph.D., Professor of Agricultural Economics and
Associate Dean of Agriculture
LOWELL LAWRENCE BLAISDELL, Ph.D., Professor of History
LAWRENCE EDWARD BOWLING, Ph.D., Professor of English
JOHN ROSS BRADFORD, Ph.D., Reg. Prof. Engr. (Ohio and Texas), Professor of
Chemical Engineering and Dean of Engineering
WELDON LEROY BRADSHAW, B.S. in Arch., Reg. Arch. (Texas), Professor of
Architecture
JOHN PAUL BRAND, Ph.D., Professor of Geosciences
(On leave, 1963-1964)
ROGER LEON BROOKS, Ph.D., Professor of English and Associate Dean of the
Graduate School
(Appointed Associate Dean Feb. 1, 1964)

- L. ANN BUNTIN, Ed.D., Professor and Head of the Department of Home Economics Education
- WILLIAM GASTON CAIN, JR., Ph.D., Professor of Management
- EARL D. CAMP, Ph.D., Professor and Head of the Department of Biology
- TRUMAN WILDES CAMP, Ph.D., Professor of English
- VERNON THOMAS CLOVER, Ph.D., Professor of Economics
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- JAMES CECIL CROSS, Ph.D., Professor of Biology
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- JAMES WILLIAM DAVIS, Ph.D., Professor and Head of the Department of Government
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- JOE DENNIS, Ph.D., Professor and Head of the Department of Chemistry
- MERTON LYNN DILLON, Ph.D., Professor of History
- TIMOTHY PAUL DONOVAN, Ph.D., Associate Professor of History
- ARTHUR LINCOLN DRAPER, Ph.D., Associate Professor of Chemistry
- WILLIAM LYON DUCKER, B.S., Reg. Prof. Engr. (Texas and Oklahoma), Professor and Head of the Department of Petroleum Engineering
- RICHARD ALBERT DUDEK, Ph.D., Professor and Head of the Department of Industrial Engineering and Engineering Drawing
- RALPH MARION DURHAM, Ph.D., Professor and Head of the Department of Animal Husbandry
- GEORGE OLIVER ELLE, Ph.D., Professor of Horticulture and Assistant Dean of Agriculture
(Appointed Assistant Dean Feb. 10, 1964)
- RAYMOND PRUITT ELLIOTT, M.S., Professor of Music
- BERLIE JOSEPH FALLON, Ed.D., Professor of Education
- GORDON FULLER, Ph.D., Professor of Mathematics
- STERLING HALE FULLER, Ph.D., Professor of Government
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- EUNICE JOINER GATES, Ph.D., Professor of Foreign Languages
- WILLIAM BRYAN GATES, Ph.D., Professor of English
- EVERETT ALDEN GILLIS, Ph.D., Professor of English
- EARL HOWARD GILMORE, Ph.D., Associate Professor of Mathematics
- ROBERT CABANISS GOODWIN, Ph.D., Professor of Chemistry and President
- LAWRENCE LESTER GRAVES, Ph.D., Professor of History
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- THOMAS EARLE HAMILTON, Ph.D., Professor of Spanish
- FRED GEORGE HARBAUGH, D.V.M., Professor of Animal Husbandry and Veterinary Science and Veterinarian
- CLARK HARVEY, Ph.D., Professor of Agronomy
- EMMETT ALLEN HAZLEWOOD, Ph.D., Professor and Head of the Department of Mathematics
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- ELLIS RICHARD HEINEMAN, M.A., Professor of Mathematics
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 WILLIAM CURRY HOLDEN, Ph.D., Professor of History and Director of the
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 J. W. JACKSON, M.A., Professor of Government
 WILLIAM MORLEY JENNINGS, B.S., Professor of Health, Physical Education and
 Recreation for Men
- SABE McCLAIN KENNEDY, Ph.D., Professor of Government and Dean of Arts and
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 and Counseling Center
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 PAUL MERVILLE LARSON, Ph.D., Professor and Head of the Department of Speech
 THOMAS LUTHER LEACH, M.S., Professor and Head of the Department of
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 GEORGE PEYTON MECHAM, Ph.D., Professor of Education
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 ROBERT LEE NEWELL, M.S. in M.E., Reg. Prof. Engr. (Texas), Professor of
 Mechanical Engineering and Assistant Dean of Engineering
- FRED WAYLAND NORWOOD, Ph.D., C.P.A., Professor of Accounting
 AARON GUSTAF OBERG, Ph.D., Professor of Chemical Engineering
 HARLEY DEAN OBERHELMAN, Ph.D., Professor and Head of the Department of
 Foreign Languages
- WILLIAM EUGENE ODEN, Ph.D., Associate Professor of Government
 L. E. PARSONS, B.S., Reg. Prof. Engr. (Texas), Professor and Acting Head of the
 Department of Textile Engineering
- WILLIAM ROBERT PASEWARK, Ph.D., Professor and Head of the Department of
 Business Education
- WILLIAM MARTIN PEARCE, Ph.D., Professor of History and Vice President for
 Academic Affairs

- MILTON LESTER PEEPLES, Ph.D., Associate Professor of Dairy Industry
 CONNER COLUMBUS PERRYMAN, B.S., Reg. Prof. Engr. (Texas), Professor of
 Engineering Drawing
 FLORENCE ELOISE PETZEL, Ph.D., Professor of Clothing and Textiles
 LOUIS JOHN POWERS, M.S. in M.E., Reg. Prof. Engr. (Texas), Professor and Head
 of the Department of Mechanical Engineering
 PAUL VERDAYNE PRIOR, Ph.D., Professor of Biology
 VERNON WILLARD PROCTOR, Ph.D., Professor of Biology
 ROBERT GEORGE REKERS, Ph.D., Associate Professor of Chemistry
 JULES ALEXANDER RENARD, Licencie en Sciences Chimiques, Universite Paul
 Pastur, Belgium; Ingenieur-Chimiste, Universite de Nancy, France, Associate
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 KARL REUNING, Ph.D., Visiting Professor of English
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 Graduate School
 WALTER BOB ROGERS, Ph.D., Associate Professor of Agricultural Economics
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 and the Department of Finance
 GEORGE ROSS ROY, Ph.D., Professor of English
 REGINALD RUSHING, Ph.D., C.P.A., Professor and Head of the Department of
 Accounting
 JOHN ALLEN RYAN, Ph.D., Professor and Head of the Department of Marketing
 WALEED ABDULLA AL-SALAM, Ph.D., Associate Professor of Mathematics
 (On leave, Spring Semester 1964)
 BILLY JOE SANDLIN, Ph.D., Associate Professor of Physics
 ELIZABETH SKIDMORE SASSER, Ph.D., Professor of Architecture and Allied Arts
 CLARENCE CARL SCHMIDT, Ph.D., Professor of Physics
 JESSE Q. SEALEY, Ph.D., Professor of Biology
 MARTHA GENE SHELDEN, Ph.D., Professor and Head of the Department of Clothing
 and Textiles
 HENRY JOSEPH SHINE, Ph.D., Professor of Chemistry
 DESKIN HUNT SHURBET, JR., M.A., Professor of Geosciences and Director of the
 Seismological Observatory
 EARL ROLAND SIFERT, Ph.D., Part-time Visiting Professor of Education
 VAN MITCHELL SMITH, JR., Ph.D., Associate Professor of History
 HAROLD AYLESWORTH SPUHLER, Ph.D., Professor and Head of the Department
 of Electrical Engineering
 WINFRED GEORGE STEGLICH, Ph.D., Professor and Head of the Department of
 Sociology and Anthropology
 RUSSELL WILLIAM STRANDTMANN, Ph.D., Professor of Biology
 ALFRED BELL STREHLI, M.A., Professor of Foreign Languages
 PASCHAL NEILSON STRONG, JR., Ph.D., Associate Professor of Psychology
 ALAN LANG STROUT, Ph.D., Professor of English
 ARTHUR B. SWENEY, Ph.D., Associate Professor of Psychology
 HASKELL GRANT TAYLOR, M.A., C.P.A., Professor of Accounting
 GERALD WAYLETT THOMAS, Ph.D., Professor of Range Management and Dean of
 Agriculture
 (On leave Feb. 10 through Aug. 31, 1964)
 HENRY COFFMAN THOMAS, Ph.D., Professor and Head of the Department of
 Physics
 DONALD WARD TINKLE, Ph.D., Professor of Biology
 WILLA VAUGHN TINSLEY, Ph.D., Professor of Home and Family Life and Dean of
 Home Economics
 WILLIE LEE ULICH, Ph.D., Professor and Head of the Department of Agricultural
 Engineering

ELO JOE URBANOVSKY, B.S., Professor and Head of the Department of Park Management, Horticulture, and Entomology, and College Landscape Architect
 DAVID MARTELL VIGNESS, Ph.D., Professor and Head of the Department of History
 FRANKLIN ALTON WADE, Ph.D., Professor and Head of the Department of Geosciences
 ERNEST WALLACE, Ph.D., Professor of History
 MORRIS SHEPPARD WALLACE, Ed.D., Professor and Head of the Department of Education and Philosophy
 WESLEY WILLIAM WENDLANDT, Ph.D., Professor of Chemistry
 GEORGE ARTHUR WHETSTONE, Ph.D., Professor of Civil Engineering
 JUDDIE JOHNSON WILLINGHAM, Ph.D., Professor and Head of the Department of Dairy Industry
 ARTHUR WESLEY YOUNG, Ph.D., Professor and Head of the Department of Agronomy and Range Management

Associate Members

Associate Members of the Graduate Faculty teach courses of all graduate levels and act as members of students' advisory committees except that they may not serve as chairmen of doctoral committees.

BURL MONROE ABEL, M.B.A., Associate Professor of Finance
 THEODOR WALTER ALEXANDER, M.S., Associate Professor of Foreign Languages
 ARCHIE CORNELIOUS ALLEN, Ph.D., Assistant Professor of Biology
 BONNIE L. ALLEN, Ph. D., Associate Professor of Agronomy
 ROBERT DANIEL AMASON, Ph.D., Associate Professor of Marketing
 HUGH ALLEN ANDERSON, M.A. Associate Professor of Economics
 JOHN ARTHUR ANDERSON, Ph.D., Assistant Professor of Chemistry
 CLIFFORD ASHBY, Ph.D., Associate Professor of Speech
 THOMAS ANDREW ATCHISON, Ph.D., Assistant Professor of Mathematics
 MOHAMED MOHAMED AYOUB, M.S., Assistant Professor of Industrial Engineering
 JOHN HENRY BAUMGARDNER, M.S., Professor of Animal Husbandry
 ETHEL JANE BEITLER, M.Ed., Associate Professor of Applied Arts
 RICHARD ANTHONY BERGER, Ph.D., Assistant Professor of Health, Physical Education, and Recreation for Men
 GEORGE WILLIAM BERRY, Ph.D., Associate Professor of Finance
 RICHARD EMERSON BERRY, Ph.D., Associate Professor of Physics
 ROY T. BOWLES, B.S., Assistant Professor of Sociology
 THADIS WAYNE BOX, Ph.D., Professor of Range Management
 FAYE LAVERNE BUMPASS, D.Litt., Associate Professor of Spanish
 MARY SUE CARLOCK, Ph.D., Associate Professor of English
 WALTER JOSEPH CARTWRIGHT, M.A., Assistant Professor of Sociology
 SAMUEL WHITTEN CHISHOLM, M.B.A., C.P.A., Associate Professor of Accounting
 PEDER G. CHRISTIANSEN, Ph.D., Assistant Professor of Foreign Languages
 CECIL ROBERTS COALE, JR., Ph.D., Assistant Professor of Electrical Engineering
 JOHN WILLIAM COBB, JR., P.E.D., Associate Professor of Health, Physical Education, and Recreation for Men
 JACQUELIN COLLINS, Ph.D., Assistant Professor of History
 DUANE AUSTIN CRAWFORD, M.S., Assistant Professor of Petroleum Engineering
 SAMUEL EVERETT CURL, Ph.D., Assistant Professor of Animal Husbandry
 MARVIN F. DALEY, Ph.D., Assistant Professor of Psychology
 LEWIS JAMES DAVIES, Ph.D., Associate Professor of Sociology
 KENNETH WALDRON DAVIS, Ph.D., Assistant Professor of English
 HARRY De La RUE, A.M., Assistant Professor of History
 LOLA MARIE DREW, M.A., Associate Professor of Home Management
 MARVIN JOHN DVORACEK, M.S., Assistant Professor of Agricultural Engineering

- BILLY HOWARD EASTER, S.M., Reg. Prof. Engr. (Texas), Assistant Professor of Electrical Engineering
- LUTA PELHAM EAVES, M.B.A., Assistant Professor of Accounting
- FLOYD EUGENE EDDLEMAN, Ph.D., Assistant Professor of English
- ULRICH LEWIS EGGENBERGER, M.S., Assistant Professor of Agricultural Education
- ARTHUR McAULEY ELLIOTT, Ph.D., Assistant Professor of Biology
- GEORGE FORBES ELLIS, JR., Ph.D., Associate Professor of Animal Husbandry
- DOROTHY J. FILGO, M.A., Assistant Professor of Education
- CLARENCE GERALD GARDNER, Ph.D., Associate Professor of Physics
- JOHN CHARLES GILLIAM, Ph.D., Associate Professor of Business Education and Secretarial Administration
- HOWARD ELDON GOLDEN, Ph.D., Associate Professor of Marketing
- PRESTON FRAZIER GOTT, M.A., Associate Professor of Physics
- LOLA BETH GREEN, Ph.D., Associate Professor of English
- A. MAYNOR HARDEE, Ph.D., Associate Professor of Foreign Languages
- JOHN ELZIE HARDING, M.A., Assistant Professor of Management and of Economics
- LEVI MARLIN HARGRAVE, M.S., Professor of Agricultural Education
- RAE LAWRENCE HARRIS, JR., Ph.D., Associate Professor of Geosciences
- DELMAR DWIGHT HARTLEY, Ph.D., Assistant Professor of Finance
- HARRY GEORGE HECHT, Ph.D., Assistant Professor of Chemistry
- HUBERT REED HEICHELHEIM, Ph.D., Assistant Professor of Chemical Engineering
- SHELBY KEITH HILDEBRAND, Ph.D., Assistant Professor of Mathematics
- GLADYS KEEN HOLDEN, M.S. in H.E., Associate Professor of Food and Nutrition
- EDNA NAWANNA HOUGHTON, B.A. in F.A., Associate Professor of Architecture and Allied Arts
- ELLIS WRIGHT HUDDLESTON, Ph.D., Assistant Professor of Entomology and Assistant Professor of Biology
- FRANK ALDEN HUDSON, Ph.D., Associate Professor of Animal Husbandry
- ALEXANDER POPE HULL, JR., Ph.D., Associate Professor of Foreign Languages
- WILLIAM KEITH ICKES, Ph.D., Associate Professor of Speech
- ALONZO DAVID JACKA, Ph.D., Assistant Professor of Geosciences
- CHESTER CARTWRIGHT JAYNES, M.S. in Ag., Assistant Professor of Agronomy
- WILLIAM LOYD JENKINS, M.S. in S.E., Reg. Prof. Engr. (Texas), Associate Professor of Industrial Engineering and Engineering Drawing
- PHILIP JOHNSON, B.S., Reg. Prof. Engr. (Texas), Associate Professor of Petroleum Engineering
- AFZAL MUHAMMAD KAZI, Ph.D., Visiting Professor of Mathematics
- CLIFF HUTCHINSON KEHO, M.S., Reg. Prof. Engr. (Texas), Associate Professor of Civil Engineering
- ERNST WILLIE KIESLING, M.S. in A.M., Assistant Professor of Civil Engineering
- LILA ALLRED KINCHEN, M.S., Associate Professor of Clothing and Textiles
- MURRAY R. KOVNER, Ph.D., Professor of Psychology
- LYLE CARLTON KUHNLEY, Ph.D., Assistant Professor of Biology
- MARTIN THEODORE KYRE, Ph.D., Assistant Professor of Government
- ROBERT MALCOLM LAWRENCE, Ph.D., Assistant Professor of Government
- CHARLES ALFRED LAWRIE, M.Mus., Assistant Professor of Music
- ARCHIE LEROY LEONARD, M.S., Associate Professor of Agricultural Economics
- HELEN ALMA LINDELL, M.A., Assistant Professor of Speech
- TROY ALLEN LOCKARD, M.A., Associate Professor of Applied Arts
- VINCENT P. LUCHSINGER, Ph.D., Assistant Professor of Management
- RAYMOND DeELMONT MACK, M.A., Assistant Professor of Government
- HORACE JURs MacKENZIE, M.S., Reg. Prof. Engr. (Texas), Associate Professor of Industrial Engineering and Engineering Drawing
- (On leave, Spring Semester 1964)
- GLEN ALAN MANN, Ph.D., Assistant Professor of Physics
- ROBERT EDWARD MARTIN, M.S., Reg. Prof. Engr. (Texas), Associate Professor of Mechanical Engineering

- ROBERT LOUIS MASON, M.S. in M.E., Reg. Prof. Engr. (Texas), Professor of Mechanical Engineering and Supervising Engineer
- HENRY JAMES MAXWELL, Ph.D., Associate Professor of Foreign Languages
- DARRELL KEITH McCARTY, M.M., Associate Professor of Music
- CLARA MUELLER McPHERSON, M.S., Assistant Professor of Food and Nutrition
- CHARLES KIMBROUGH MEGIBBEN, Ph.D., Assistant Professor of Mathematics
- DAN DEAN NIMMO, Ph.D., Assistant Professor of Government
- ROBERT LEWIS PACKARD, Ph.D., Assistant Professor of Biology
- ROBERT MARSHALL PARKER, M.A., Associate Professor of Mathematics
- RODERICK PARKINSON, M.S. in Ed., Assistant Professor of Architecture
- HUGH PENDEXTER, III, Ph.D., Associate Professor of English
- GEORGE REX PHILBRICK, M.Ed. in P.Ed., Professor of Health, Physical Education, and Recreation for Men
- WILLIE EDWARD PHILLIPS, Ph.D., Associate Professor of Electrical Engineering
- SUE AVA RAINEY, M.A., Associate Professor of Health, Physical Education, and Recreation for Women
- JOSEPH BLAND BOB RAY, Ph.D., Associate Professor of Psychology
- CORWIN C. REEVES, JR., M.S., Assistant Professor of Geosciences
- LEVERN ANTHONY REIS, M. of Metallurgical Engr., Assistant Professor of Mechanical Engineering
- CHARLES LATHAN RIGGS, Ph.D., Professor of Mathematics
(On leave, 1963-1964)
- GEORGE STIEGLER ROBBERT, Ph.D., Assistant Professor of History
- ARTHUR THEOPHILE ROBERTS, Ph.D., C.P.A., Associate Professor of Accounting
- CHESTER MORRISON ROWELL, JR., M.S., Assistant Professor of Biology
(On leave 1963-1964)
- ALBERT JOSEPH SANGER, M.S. in C.E., Reg. Prof. Engr. (Texas), Associate Professor of Civil Engineering
- JEANETTE LOIS SCAHILL, Ph.D., Associate Professor of Health, Physical Education and Recreation for Women
- MORRIS HENRY SCHNEIDER, M.S. in I.E., Assistant Professor of Industrial Engineering
- RONALD EDWARD SCHULZ, M.A., Associate Professor of Speech
- RUSSELL HOLLAND SEACAT, JR., Ph.D., Reg. Prof. Engr. (Texas), Associate Professor of Electrical Engineering
- GERALD LYNN SHURBET, M.S., Assistant Professor of Mathematics
- HAROLD LESTER SIMPSON, Ph.D., Associate Professor of Foreign Languages
- CAREY THOMAS SOUTHALL, JR., Ed.D., Associate Professor of Education
- TOM BASIL STENIS, M.S. in E.E., Reg. Prof. Engr. (Texas), Associate Professor of Electrical Engineering
- ARTHUR BARCLAY SWENEY, Ph.D., Associate Professor of Psychology.
- RICHARD JOHN THOMPSON, Ph.D., Assistant Professor of Chemistry
- JOE WAYNE TIDROW, Ed.D., Associate Professor of Education
- RICHARD KRAUSE TRACY, B.F.A., Associate Professor of Architecture and Allied Arts
- SCOTTI MAE TUCKER, Ph.D., Associate Professor of Spanish
- KIRK B. TURNER, M.S., Associate Professor of Animal Husbandry
- MARY JEANNE van APPLIEDORN, M.Mus., Associate Professor of Music
- HARRY STUART WALKER, M.B.A., Assistant Professor of Economics
- HOLMES ANDREW WEBB, Ed.D., Associate Professor of Education
- NORMAN EDWARD WEIR, Ph.D., Associate Professor of Economics and Finance
- DAVID MORRIS WELBORN, Ph.D., Assistant Professor of Government
- OLIVE BOONE WHEELER, Ed.D., Associate Professor of Education
- ROBERT KELLER WHITE, Ph.D., Assistant Professor of Psychology
- RICHARD EDWARD WILDE, Ph.D., Assistant Professor of Chemistry
- BILLIE FRANCES WILLIAMSON, M.A., Associate Professor of Home Economics
Education and Assistant to the Dean of Home Economics

HORACE EUGENE WOODWARD, JR., M.A., Associate Professor of Mathematics

BARBARA JEAN ZECHES, M.S., Assistant Professor of Food and Nutrition

DALE WENDEL ZINN, M.S., Associate Professor of Animal Husbandry

(On leave, 1963-1964)

EDWARD WILLIAM ZUKAUCKAS, JR., M.S., Associate Professor of Horticulture and
Greenhouse Manager

General Information

Historical and Geographical Statement

Texas Technological College, which was founded in 1923 and enrolled its first students in the autumn of 1925, is a State-supported coeducational institution comprising the School of Agriculture, the School of Arts and Sciences, the School of Business Administration, the School of Engineering, the School of Home Economics, the Division of Extension, and the Graduate School.

Lubbock, the seat of Texas Technological College, is a city of approximately 150,000 inhabitants. It is situated in the Plains area of West Texas at an altitude of 3,256 feet. Dry, crisp air and sunny days throughout practically the entire year provide a healthful and invigorating climate.

Three airlines, two railways, splendid highways, and a network of bus routes make the city easily accessible from all directions.

The College campus lies at the western edge of the business section of the city. On the other three sides are residential areas. The College buildings number more than 158, of which 94 are considered permanent structures.

The first president of Texas Technological College was Paul Whitfield Horn (1925-1932). He was followed by Bradford Knapp (1932-1938), Clifford Bartlett Jones (1938-1944, President Emeritus, 1944—), William Marvin Whyburn (1944-1948), Dossie Marion Wiggins (1948-1952), Edward Newlon Jones (1952-1959), and Robert Cabaniss Goodwin (1959—).

Graduate work has been offered at Texas Technological College since 1927. In 1937, the graduate program became a separate unit under its own dean and council. Between 1928, when the first Master's degree was awarded, and Aug. 31, 1963, a total of 2,970 Masters' degrees had been conferred; and since 1952, when the first doctorate was awarded, 94 Doctors' degrees have been conferred; of these 40 are Ph.D.'s and 54 are Ed.D.'s.

The following professors have served as graduate dean: William Albert Jackson (1937-1938), Robert Cabaniss Goodwin (1938-1945), William Curry Holden (1945-1950), William Bryan Gates (1950-1963), and Fred Durnford Rigby (1963-).

Housing Accommodations

Prospective graduate students who are interested in living in a College residence hall should address an inquiry to the Office of Room Reservations.

Information concerning living accommodations off the campus may be obtained from the Office of the Dean of Men or the Office of the Dean of Women.

The Library

In the spring of 1962, the Library moved from its long-since outgrown quarters (erected in 1937) into its completely air-conditioned new building which provides open-stack facilities for all and convenient study space for graduate students.

For more than a decade, the emphasis in new acquisitions has been upon items needed for research by faculty members and by graduate students, particularly in the departments offering doctoral work. Especially significant are the virtually complete files of many of the principal scholarly journals — domestic and foreign — and rare material in microfilm and microcard reproductions. Significant materials recently acquired are a depository collection of the Atomic Energy Commission publications, and a History of Science collection consisting of over 1,400 items.

The Southwest Collection

Of special interest to students of the culture of this area is the Southwest Collection, which is located in the Social Science Building (formerly the Library Building) and which comprises a large assortment of books, newspapers, letters, and other manuscripts dealing with the Southwest.

Student Health Service

The College Infirmary provides limited accommodations for regularly enrolled students who are ill enough to require constant supervision but who do not require surgery or the services of specialists. The College cannot provide students with hospital service elsewhere, and it cannot assume responsibility for the continued medical care of students suffering from chronic diseases.

Additional details about the Student Health Service may be found in the General Catalog of Texas Technological College.

Graduate Degrees and Teachers' Certificates

Prospective students should understand that the material in this Bulletin applies only to requirements for graduate degrees and has no direct relation to certificates for public school teachers. The Graduate School gives no assurance that a program for a graduate degree and a program for a certificate will coincide. Students interested in certificates should confer with the Director of Teacher Certification at the outset of their work.

The Placement Service

Graduate students are urged to file their complete records (including photographs) at the Office of the Placement Service (252 West Engineering Building) even though they may not contemplate immediate use of its facilities. Experience has shown that sooner or later almost every graduate with a Master's or Doctor's degree feels the need of having his record on

file at the Placement Office. Assembling such a record after the student has left the campus is difficult and sometimes impossible.

Fees and Deposits

The following information concerning fees and deposits applies only to semesters of a long session; the Summer School Bulletin carries details about fees required in the summer terms.

Texas Technological College reserves the right to change fees at any time in keeping with acts of the Texas State Legislature or of the Board of Directors of the College.

No student is considered enrolled in the College until final settlement of fees has been made. Checks, money orders, and drafts are accepted subject to final payment.

By an act of the Texas Legislature, students who are not legal residents of Texas are required to pay a higher registration fee than those who are residents of the State. Prospective students should consult the Dean of Admissions about their legal residence. Any student who wrongfully pays the fees charged legal residents of Texas is subject to a penalty.

REGISTRATION FEE PER SEMESTER FOR RESIDENTS OF TEXAS:

For 12 or more semester hours	\$50
For 11 semester hours	\$47
For 10 semester hours	\$43
For 9 semester hours	\$39
For 8 semester hours	\$35
For 7 semester hours	\$31
For 6 semester hours	\$27
For 5 semester hours	\$23
For 4 semester hours	\$19
For 3 semester hours or less	\$15

REGISTRATION FEE PER SEMESTER FOR NON-RESIDENTS:

For 12 or more semester hours	\$200
For 11 semester hours	\$184
For 10 semester hours	\$167
For 9 semester hours	\$150
For 8 semester hours	\$134
For 7 semester hours	\$117
For 6 semester hours	\$100
For 5 semester hours	\$ 84
For 4 semester hours	\$ 67
For 3 semester hours or less	\$ 50

STUDENT SERVICES FEE: \$17 per semester; required of all students enrolling for 6 or more semester hours.

GENERAL PROPERTY DEPOSIT: \$7, which must be maintained at all times by replacement of charges against it. The unused portion is returnable if a request is made not later than four years after the student's last attendance.

STUDENT UNION FEE: \$5 per semester; required of all students enrolling for 3 or more semester hours.

LABORATORY FEES: \$2 per semester for each course carrying 3 semester hours' credit or less; \$4 per semester for each course carrying 4 or more semester hours' credit.

CHANGE-OF-SCHEDULE FEE: \$3 for each change after registration has been completed unless the change is made for the convenience of the College.

VISITOR'S FEE: \$10 for each course. Applicable only to persons not enrolling in the College.

ENROLLMENT FOR NO CREDIT: A student regularly enrolled in the College in either a regular or a summer session may register for residence courses for no credit and no grade. Such registrations are considered on the same basis as credit registrations in determining fees and course loads. A student registered for no credit has the privilege of taking part in class discussions, submitting papers, and taking examinations.

FEE FOR REPLACING A LOST I-D ACTIVITY CARD:

Fall Semester	Spring Semester	Fee
After Oct. 15	After March 1	\$12.75
After Nov. 15	After April 1	\$ 8.50
After Dec. 15	After May 1	\$ 4.25

FEE FOR A DUPLICATE RECEIPT: \$.50.

LOCKER OR GYMNASIUM FEE: Students who are not enrolled in a class in physical education but who wish to use the gymnasium will be required to pay a fee of \$1 for a locker. Towel service is available for a fee of \$2, \$1 of which represents a deposit. This deposit is refundable at the end of the semester.

FACULTY FEE FOR GYMNASIUM-NATATORIUM FACILITIES: \$2 for each fiscal year or portion thereof.

FEES FOR SPECIAL COURSES AND FACILITIES:

APPLIED MUSIC

For private instruction in certain courses in
Applied Music (115, 116, 215, 216, 315, 316)\$15

For private instruction in certain courses in
Applied Music (025, 026, 125, 126, 225, 226,
235, 236, 325, 326, 345, 346, 425, 426, 435,
436, 445, 446)\$30

For use of a practice room and piano, the semester fee is \$5 per hour for each day and \$2.50 for each additional hour. The fee for the rental of musical instruments for classes in strings, woodwinds, and brass (each class) is \$2.50.

HEALTH, PHYSICAL EDUCATION, AND RECREATION FOR MEN

P.E. 4321 \$12.50

HEALTH, PHYSICAL EDUCATION, AND RECREATION FOR WOMEN

P.E. 4321 \$12.50

GRADUATION FEE: \$5. Once a diploma has been ordered for a student, there can be no refund of this fee even if he does not graduate as expected. For a subsequent graduation, a supplementary fee of \$2 is required.

FEE FOR GRADUATING IN ABSENTIA: \$1.50.

FEE FOR BINDING REPORTS, THESES, AND DISSERTATIONS: Usually \$3 per copy, but the fee is subject to change without notice. The fee for the microfilming of a doctoral dissertation is \$25. Details are shown on Page 38 of this Bulletin.

EXEMPTION FROM FEES BECAUSE OF HONORABLE DISCHARGE FROM THE ARMED FORCES: Information may be obtained from the Coordinator of Veterans' Affairs in the Office of the Registrar.

REFUND OF FEES: Refunds are not made on courses of less than six weeks' duration. A student who is suspended from the College is not entitled to a refund of fees. With these exceptions, a student who officially withdraws during either semester will receive a refund of registration and activity fees according to the following schedule:

First class day through the 14th class day80 per cent
Fifteenth through the 20th class day60 per cent
Twenty-first through the 25th class day40 per cent
Twenty-sixth through the 30th class day20 per cent
After the 30th class dayno refund

Fellowships and Assistantships

All inquiries concerning fellowships and assistantships should be addressed to the head of the department concerned.

Fellowships

A number of fellowships requiring no duties on the part of the student are offered.

Three-year fellowships are available for doctoral students in physics under the provisions of the National Defense Education Act.

Fellowships from the National Science Foundation are available under both the Cooperative Graduate Fellowship Program and the Program of Summer Fellowships for Graduate Teaching Assistants.

Under a grant from the National Aeronautics and Space Administration, six predoctoral traineeships in the space sciences have been awarded to begin in September, 1964.

Assistantships

Most of the departments which participate in the graduate program have Graduate Teaching Assistantships for properly qualified students. The duties and stipends vary in relation to the qualifications of the recipient and the amount of service he renders.

Policies and Regulations

Nature of Graduate Study

Graduate study is much more than a continuation of undergraduate work. Its true spirit is one of inquiry and the desire to add something to human knowledge. Graduate study should therefore be contemplated only by students who have already demonstrated in their undergraduate programs unusual intellectual attainments and the power of independent thought and investigation.

For this reason, practically all graduate schools exercise some type of selectivity in their admission of students. Selective entrance requirements are partly for the maintenance of the high standards that must always characterize graduate study and partly for the benefit of students in helping them decide early whether they should undertake such work.

The Graduate School of Texas Technological College recognizes its obligation both to the standards mentioned above and to the citizens of Texas. In connection with the first obligation, the Graduate School requires evidence of an applicant's special ability for admission to its degree programs and reserves the right to decline to accept any applicant whose admission would not be to his best interest or that of the College. On the other hand, under its twofold classification of graduate students, the Graduate School makes its facilities available to a wide variety of students, whether they are applicants for degrees or not.

The Graduate School, like other schools of Texas Technological College, reserves the right to institute, after due notice and during the course of a student's work toward a degree, any new ruling which may be necessary for the good of the College and therefore, ultimately, of recipients of its degrees.

Responsibility of Students

Graduate students are expected to make themselves thoroughly familiar with the regulations of the Graduate School and the requirements for degrees. Failure to follow the regulations and requirements almost inevitably results in complications for which the Graduate School cannot assume responsibility.

To facilitate communications, graduate students should promptly notify the Graduate Office of their changes of address.

Affidavit Required by State Law

By an act of the Texas Legislature, every person owing allegiance to the United States is required to sign an affidavit of loyalty in the presence of a Notary Public before he may be permitted to register in a Texas state-supported college or university.

Admission to the Graduate School

Two types of admission are granted: (1) GENERAL ADMISSION TO THE GRADUATE SCHOOL (that is, admission as an "Unclassified Graduate Student") and (2) ADMISSION TO A GRADUATE DEGREE PROGRAM. The requirements are explained in the following paragraphs.

GENERAL ADMISSION TO THE GRADUATE SCHOOL is granted through the Office of the Dean of Admissions. The basic prerequisite for admission to the Graduate School, regardless of the type of admission sought, is the possession of an acceptable Bachelor's degree from a recognized college or university. General admission is granted on the basis of a formal application and satisfactory transcripts of the applicant's previous academic work. These documents should be submitted at least 30 days prior to the proposed enrollment—60 days by applicants outside the United States.

ADMISSION TO A GRADUATE DEGREE PROGRAM is granted through the Office of the Dean of the Graduate School and is restricted to applicants whose undergraduate records and scores on the Aptitude Test of the Graduate Record Examinations indicate probable success in such work.

Procedure for Students Seeking Admission to a Master's or Doctor's Degree Program

All applicants must obtain general admission to the Graduate School before they can be considered for admission to a Master's or Doctor's degree program. If possible, applicants should take the Aptitude Test of the Graduate Record Examinations early enough to have their test scores sent to the Dean of the Graduate School prior to their enrollment.

An applicant who has been granted general admission to the Graduate School but has not taken the Aptitude Test of the Graduate Record Examinations will be permitted to enroll in the Graduate School with the understanding that he will take the Aptitude Test at the first administration of it after his initial enrollment. This policy applies to any enrollment, whether graduate credit is involved or not, and is basically for the protection of the student. It is much to a student's advantage to ascertain as soon as possible whether he has satisfied the requirements for admission to a degree program. Unnecessary postponement of the Aptitude Test may result in a denial of degree credit for work already completed and may jeopardize an applicant's chances of admission to a degree program.

An applicant who has been granted general admission to the Graduate School and who has already taken the Aptitude Test of the Graduate Record Examinations should ask the Educational Testing Service to send his test scores to the Dean of the Graduate School.

As soon as the Graduate Office receives the test scores of an applicant who has been granted general admission, the Dean of the Graduate School will evaluate the record, confer with the head of the student's proposed major department, and inform the applicant whether or not he has been accepted in a degree program. Students should understand, however, that the Educational Testing Service usually requires about a month to process test papers and distribute reports, and that the Dean and department head need some time in which to complete their evaluation of an applicant's record.

Admission to a Second Master's or Doctor's Degree Program

Permission to work toward a second graduate degree of the same level as the first is granted only in exceptional circumstances, and the applicant is subject to all requirements as a new student. No courses used for the first degree will be credited toward a second degree of the same level.

Procedure for Students Not Planning to Work Toward a Degree Here

Students who wish to enroll for courses for some non-degree purpose are required merely to secure general admission to the Graduate School.

Such students may later gain admission to a Master's or Doctor's degree program by petitioning the Dean of the Graduate School and by satisfying the customary requirements for admission to degree work. In general, however, degree credit cannot be expected for any courses completed prior to the student's official admission to a graduate degree program.

The Aptitude Test of the Graduate Record Examinations

The Aptitude Test is an objective-type examination requiring approximately three hours and yielding two scores—Verbal Factor (vocabulary and reading comprehension) and Quantitative Factor (logical and mathematical reasoning).

All of the Graduate Record Examinations, of which the Aptitude Test is merely one, are prepared and scored by the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey. (It has no connection with Princeton University.) A western office is maintained at 4640 Hollywood Boulevard, Los Angeles 27, California. Applicants from Texas should direct their correspondence to the Princeton office.

The Graduate Record Examinations are administered in at least one center (usually several centers) in each of the 50 states and the District of Columbia, and in many foreign countries. In some of these centers, the tests are administered only once or twice a year; in many others, they are given at least four times a year, usually in January, April, July, and November.

Application blanks and details about the Aptitude Test and examination dates may be obtained from the Testing and Counseling Center of Texas Technological College (which administers the tests in Lubbock), from similar agencies in other colleges and universities, or from the Educational Testing Service.

Each applicant is individually responsible for making arrangements to take the Aptitude Test and for having his scores sent to the Dean of the Graduate School, Texas Technological College, Lubbock, Texas.

The completed application form and the examination fee (currently \$7) must reach the proper office of the Educational Testing Service approximately a month in advance of the test date. Upon receipt of the application and the fee, the Educational Testing Service will mail the applicant a ticket of admission to the examination, specifying the room and the hour at which it will be held.

Applicants should note that at Texas Technological College, the Graduate Record Examinations are administered by the Testing and Counseling Center, not by the Graduate School.

Continuation in the Graduate School

Every student enrolled in the Graduate School, whether he is working toward a degree or not, is required to be diligent in his studies and to cooperate fully with the policies of the institution. The Graduate School reserves the right to place on probation or to drop from its rolls any graduate student who does not maintain a satisfactory academic standing or who fails to conform to the regulations of the College or to the conventions of good citizenship.

Acceptance by the Departments

As indicated under the heading of "Admission to the Graduate School," applicants for admission to graduate degree programs must be accepted by their proposed major departments as well as by the Dean of the Graduate School. Such acceptance is merely provisional, however, and does not constitute admission to candidacy for a degree.

If a student who has been accepted by one department wishes to transfer to another, he is required to present at the Graduate Office a written statement from each department certifying that the transfer is authorized.

Graduate Advisers

The Dean of the Graduate School is the general adviser for all graduate students, but, so far as particular courses are concerned, a student is counseled by the head of his major and minor departments or by other professors designated for such counseling. Advisement in matters pertaining to teachers' certificates is the responsibility of the Director of Teacher Certification.

Eligibility for Enrollment

Members of the Faculty and Staff

Full-time members of the faculty and staff of Texas Technological College may enroll for courses only by special permission of the President of the College. In registering for graduate work, they become subject to the usual regulations of the Graduate School. However, no member of the faculty with a rank above instructor is eligible to receive a graduate degree from Texas Technological College.

Undergraduates Taking Work for Graduate Credit

An undergraduate student who is within 12 hours of graduation and who has at least a B average in his major subject may enroll for courses carrying graduate credit, subject to the approval of the dean of his undergraduate school and the Dean of the Graduate School. This approval must be obtained on special forms at the time of registration. No course taken without this approval may be counted for graduate credit.

An undergraduate who is permitted to enroll for graduate work as indicated above is required to take the Aptitude Test of the Graduate

Record Examinations at the first administration of it after his enrollment for graduate work—if he has not taken it before.

The maximum amount of work that may be scheduled by an undergraduate taking courses for graduate credit is 16 hours in a semester or 6 hours in a summer term, including graduate and undergraduate work. Undergraduates permitted to enroll for graduate work are expected to complete all of their undergraduate requirements within the academic year in which they first enroll for graduate credit.

An undergraduate may not receive credit for more than 12 semester hours of graduate work completed prior to his admission to the Graduate School as an applicant for a graduate degree.

Undergraduates Taking Graduate Courses for Undergraduate Credit

In very exceptional circumstances only, the Dean of the Graduate School, upon receipt of the explicit written recommendation of the Head of the Department concerned, may permit an undergraduate to enroll in a course listed "For Graduates."

Extra-Curricular Activities

Graduate students are not eligible to hold office in an organization which is primarily for undergraduates or to participate in college-sponsored extra-curricular activities. They are encouraged, however, to participate in honor societies for which they may be qualified. Graduate students who are satisfactorily pursuing a full-time program of graduate work are eligible to serve as officers in organizations of this type.

Rank of Courses

Courses numbered in the 500 series and above are for graduate students. Most of the courses numbered in the 400 series and some of those in the 300 series may be taken for graduate credit. In such courses, a graduate student may, at the discretion of his professor, be assigned additional work beyond that required of undergraduates.

Approximately half of the work credited toward a Master's degree is expected to be in courses designated for graduate students. Most of the work credited toward a Doctor's degree should be in courses of this rank.

Amount of Work Permitted

A full graduate schedule is 12 hours in a semester or 6 hours in a summer term. The maximum enrollment in the Graduate School is 16 hours in a semester or 6 hours in a summer term.

For teaching fellows or others employed in part-time positions on the campus, the permissible load will be determined by the Dean and the head of the student's major department.

Full-time employees of the College are limited to 3 hours of graduate work in any term or semester.

Included in a graduate student's total load are extension courses and correspondence courses which he may be taking for the removal of deficiencies.

Registration

General Procedure

Students who have been granted "General Admission to the Graduate School" (see Page 22 of this Bulletin) are expected to register in the Graduate School whether they contemplate degree work or not.

The details of registration are under the jurisdiction of the Registrar, who furnishes to each enrollee complete instructions for all steps in the procedure. Students should follow carefully those instructions and the additional ones listed below.

Departmental Approval of Courses

The student should have his complete schedule of courses made out by an official representative of his major department and then have each individual course approved by a representative of the department offering it. It is the student's responsibility to see that the class tickets which are issued him correspond exactly to the courses listed on his schedule card.

Dean's Approval of Registration

When the approvals mentioned above have been secured and the registration cards have been completely filled out, the student is required to submit his registration cards to the Dean of the Graduate School for approval.

At this stage of the procedure, the student will be asked to state the type of credit he seeks in each course for which he is enrolling, and the proper designation will be stamped on his class tickets for the guidance of his professors.

A graduate student may enroll in certain 300 and 400 courses for (1) Graduate Credit, (2) Undergraduate Credit, or (3) Non-Credit, and in 100 and 200 courses for (1) Undergraduate Credit or (2) Non-Credit. (Enrollment of a graduate student in a 500 course is automatically considered to be for graduate credit.) The designation of the type of credit sought in a course has no necessary relation to the student's plans in connection with a graduate degree.

Once a card has been stamped "Graduate Credit," "Undergraduate Credit," or "Non-Credit," and registration has been completed, changes in the designation of credit can be made only through the Graduate Office, and no such changes can be made after the fourth meeting of the class involved.

The registration cards of all graduate students and of all students enrolling for any graduate credit must be approved by the Dean of the Graduate School before the payment of fees.

Specific Requirements Concerning Registration

Registration in Session of Graduation

Students who began graduate study here after Sept. 1, 1963, are subject to the following regulation, which is designed to facilitate communication and to systematize the supervision of reports, theses, and dissertations:

Every candidate for a graduate degree must be registered in the Graduate School in the long session or the summer session in which his degree is conferred. For graduation in a long session (that is, at the spring commencement—May or June), a student who completes all of his work in the fall semester is not required to register in the succeeding spring semester; for graduation in a summer session (that is, at the August commencement), a student who completes all of his work in the first summer term is not required to register in the second term. Failure to graduate at the expected time necessitates additional registrations as may be necessary.

Registration for Thesis Courses

Registration for a Master's report (Course No. 630) is required at least once; for a Master's thesis (Course No. 631), at least twice; and for a Doctor's dissertation (Course No. 831), at least four times.

If a candidate's report, thesis, or dissertation has not been completed and accepted by the Dean of the Graduate School prior to the period of required final registration, as explained above, the final registration must include the appropriate thesis course (630, 631, or 831), regardless of previous registrations for it.

At the discretion of the department concerned, a student who is not regularly enrolled in the Graduate School may be required to register for the appropriate thesis course in any term or semester in which he expects to receive assistance from his thesis adviser or committee.

Enrollment for thesis courses is permitted only during a regular registration period. Students away from the campus may, however, register for a thesis course by mail, provided they make arrangements with the Registrar at least 30 days prior to the beginning of a registration period.

Changes in Schedule and Withdrawal

A graduate student who wishes to change a section, to add or drop a course, or to withdraw from the Graduate School is required to make his request at the Graduate Office. A student who quits a course without official withdrawal will receive F on it.

After a schedule has been approved and the fees have been paid, the adding or dropping of a course or the changing of a section will be subject to a charge of \$3 for each change unless the change is made for the convenience of a department or the College.

Prerequisites for a Graduate Major

For a graduate major, an applicant must have completed, or must take as undergraduate leveling work, a minimum of 18 semester hours

(including at least 12 hours on the junior or senior level) in his proposed major subject and he must be accepted by the department concerned. Any department may specify additional prerequisites if they are considered necessary and may require an applicant to pass an examination before his acceptance.

Residence

Study leading to a graduate degree involves sustained residence as well as the completion of courses. Residence, which is expressed in terms of weeks, months, or years, is credited for work done on the campus of Texas Technological College and for certain types of courses (theses, field courses, practicums, internships, individual study, or any other type of course) when offered at a place and under circumstances specifically established by the department concerned and approved by the Graduate Council in advance of the offering of the course.

Residence is not credited for work completed by extension. Courses transferred from another graduate school will not reduce the minimum residence for the Master's degree by more than six weeks.

The minimum residence for the Master's degree and the Doctor's degree will be found in the appropriate sections of this Bulletin.

Grades

The grades used in the Graduate School are the same as those used in undergraduate work (A, B, C, D, and F), but graduate credit is allowed only for courses completed with grades of A, B, and C.

For graduate credit, no assigned grade may be raised (unless an error has been made) except by a repetition of the course involved. The substitution of another course for one completed with a low grade is not permitted. If a course is repeated, the last grade is used in computation of the average, even though it may be lower than the original grade.

Work completed at another graduate school with a grade less than B will not be accepted, but grades on transferred work will not raise the grade average on courses completed in this Graduate School.

The Symbols P and I

The symbol P (in progress) is assigned for every enrollment for a Master's report (Course No. 630), Master's thesis (Course No 631), or Doctor's dissertation (Course No. 831) until the completed document has been approved by the student's adviser or committee and accepted by the Dean of the Graduate School. At that time the professor in charge will file change-of-grade cards replacing the symbol P with letter grades.

P may be given by a professor when a student's work in a research course is not quite finished but is satisfactorily in progress at the end of a semester. This symbol must be replaced by a standard letter grade before credit can be granted for the work.

The symbol I (incomplete) may be given by a professor when a student's work in a regularly organized class has not been completed at the

end of a semester and when the failure to complete the work has been solely due to causes beyond the student's control. It is not used as a substitute for F. When I stands for a year without action on the part of the student, it may become F.

Grade Requirement for Graduation

For the Master's degree in a program requiring a report or thesis, the minimum requirement for graduation is an average of B in the major subject and an over-all average of B on all courses comprising the official program for the degree (see Page 32 of this Bulletin). At its discretion, any department may require a B average of students who take a minor in the department.

For a candidate completing his Master's degree work under the former non-thesis option, the minimum requirement is a B average in the major and the minor considered separately. (See "Graduation Under a Particular Catalog," Page 30.)

For the Doctor's degree, the minimum requirement for graduation is an average of B in the major and the minor treated separately. For this calculation, all courses completed for graduate credit outside the major are considered to comprise the doctoral minor.

In the calculation of grade averages for graduation or any other purpose, grades on thesis courses are counted only to the extent of the minimum registration requirement; that is, once (3 sem. hrs.) for a Master's report; twice (6 sem. hrs.) for a Master's thesis; and four times (12 sem. hrs.) for a Doctor's dissertation.

Proficiency in English

A student found deficient in English may be required to complete satisfactorily certain specified courses in English usage (without graduate credit) before he is considered for admission to candidacy for a graduate degree.

Statement of Intention to Graduate

Not earlier than twelve weeks and not later than nine weeks prior to his proposed date of graduation, every candidate for a graduate degree must file at the Graduate Office a form known as the "Statement of Intention to Graduate." No candidate's name will be placed on the "Tentative List of Graduates" for any commencement unless this statement has been received at the Graduate Office within the time limits specified.

A candidate who fails to graduate at the expected time is required to file a new "Statement of Intention to Graduate" for any subsequent graduation.

The Master's Degree

The requirements set forth in this section are in addition to those listed under the heading of "Policies and Regulations."

Degrees Offered

In the "Program for the Master's Degree" and on the title-approval page of a report or thesis, the exact and official designation of the degree must be used:

- Master of Arts
- Master of Business Administration
- Master of Education
- Master of Science
- Master of Science in Agriculture
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Electrical Engineering
- Master of Science in Home Economics
- Master of Science in Industrial Engineering
- Master of Science in Mechanical Engineering

Prerequisites

Admission to a Master's degree program is dependent upon the applicant's undergraduate record, his scores on the Aptitude Test of the Graduate Record Examinations, and the recommendation of his proposed major department.

A substantial body of undergraduate work in the major subject and considerable breadth of background are essential for graduate study. Therefore, students whose undergraduate programs are seriously deficient in breadth or depth may be required to complete additional preparatory work without graduate credit.

Graduation Under a Particular Catalog

Effective Sept. 1, 1962, all programs for the Master's degree will require either a Master's thesis (6 semester hours) or a Master's report (3 semester hours).

A student who had begun Master's degree work under a non-thesis option may follow his original plan if — by Sept. 1, 1962 — he had filed at the Graduate Office a degree plan calling for a non-thesis program or if by that date he had completed 6 or more semester hours of acceptable graduate work which he had planned to use in such a program. A student who avails himself of this choice will satisfy the requirements for gradu-

ation which have previously been in force as shown in the last three issues of the Graduate Bulletin.

On the other hand, with the approval of his major department, a student who is eligible to continue his original plan under the provisions stated above may, if he prefers, change to a program embodying a report or thesis and satisfy the requirements published in this issue of the Bulletin.

Report and Thesis

The Master's report and the Master's thesis are alike in that each is expected (1) to represent independent work by the student, conducted under the supervision of a director, and (2) to be written clearly and concisely in good English, or whatever language may be approved as in the case of a student with a major in Spanish or French.

The thesis usually involves research, an activity which naturally varies considerably from discipline to discipline. The report may or may not be based on research; it normally represents some type of investigation, criticism, or problem solving.

Administratively, the report and the thesis are treated alike. That is, each requires the approval of its director (and any other professors considered necessary) and acceptance by the Dean of the Graduate School.

Available at the Graduate Office, free of charge, is a pamphlet setting forth the requirements for the preparation and submission of a report and a thesis. All manuscripts must conform to the published policies.

Regulations concerning registration for a report and a thesis will be found on Page 27 of this Bulletin.

Basic Programs for the Master's Degree

Students should understand that the basic programs outlined below represent simply the minimum requirements of the Graduate School. All departments have the prerogative of increasing the quantitative requirements for any or all of their majors. In general, programs involving any type of certificate (such as those for teachers, administrators, and counselors) will embody considerably more than the 30-hour minimum set by the Graduate School. The option between a report and a thesis is also a departmental prerogative although the preference of the student will naturally be considered.

The two programs are as follows:

PLAN 1: Required: A minimum of 24 semester hours of graduate course work, exclusive of credit for the Master's thesis. (For details concerning registration for the thesis, see Page 27 of this Bulletin.)

PLAN 2: Required: A minimum of 27 semester hours of graduate course work, exclusive of credit for the Master's report. (For details concerning registration for the report, see Page 27 of this Bulletin.)

Language Requirement

For the Master of Arts and Master of Science in mathematics and the pure sciences, a knowledge of a foreign language is required. This require-

ment may be applied to other degrees at the discretion of the department concerned. A student whose major is one foreign language is required to have a reading knowledge of another language.

In general, a student who has satisfactorily completed 12 or more semester hours of undergraduate work in a single foreign language acceptable to his major department and the Dean of the Graduate School is considered to have satisfied this requirement, but some departments require their majors to pass a reading examination regardless of their course work in a language. Any applicant may satisfy the requirement by examination. A student who has recently completed two or more years of high school work in a foreign language will usually find it to his advantage to take a year of college work in the same language and prepare for the reading examination. Arrangements for taking these examinations (in French, German, and Russian) can be made at the Testing and Counseling Center which administers the tests for the Educational Testing Service (GRE). The examinations are given three or four times each year; the student should consult with the Testing Center for specific dates.

The Department of Foreign Languages will continue to administer the examination in Spanish, and any acceptable foreign language other than those listed above.

Major Subject

Every program for a Master's degree must embody a major comprising at least 18 semester hours of graduate work in a subject which has been approved for major work and for which the student has, or completes without graduate credit, the prerequisites as explained on Page 30 of this Bulletin.

Minor

Every program for a Master's degree must embody a minor representing approximately one-fifth to one-fourth of the total program. The minor may be completed in a single department or in several departments, but the courses comprising the minor are subject to the following limitations: (a) they must carry graduate credit; (b) they must be acceptable to the student's major department; and (c) each course (except the specially designed ones numbered 5335) must be approved by the department offering it. This approval is indicated in the degree plan by the signature of the department head (or graduate adviser) concerned. Its purpose is to make sure that a student does not enroll for a course for which he is not prepared.

Program for the Master's Degree

Early in his first semester of graduate study, every one contemplating Master's degree work is required to submit to the Dean of the Graduate School a "Program for the Master's Degree" as prepared by an official representative of the proposed major department and of other departments as indicated under "Minor" in the preceding section.

The forms for the "Program" are available at the Graduate Office.

When the student receives his approved copy of his "Program" from the Graduate Office, he is expected to keep it and use it as the basis of all subsequent enrollments. Substitutions of courses (except the special group numbered 5335) can be made only on the written recommendation of the department or departments concerned and the approval of the Graduate Dean.

Approval of a "Program for the Master's Degree" DOES NOT, however, constitute official admission to Master's degree work or admission to candidacy for a Master's degree. It merely signifies that the proposed program will be acceptable if the student satisfies all of the regulations of the Graduate School and all of the requirements connected with his degree program.

Minimum Residence

The minimum residence for any Master's degree is a full academic year (nine months) of graduate work or its approximate equivalent in five 6-week summer terms. Part-time enrollment is evaluated on a fractional basis.

Transferred and Extension Work

There is no automatic transfer of credit toward a Master's degree, but, in general, work completed in residence at another accredited graduate school may, on the recommendation of the departments concerned, be accepted for as much as 6 semester hours toward a Master's degree. Credit accepted from another graduate school will in no instance reduce the minimum residence by more than six weeks.

A maximum of 6 semester hours of extension work completed through the Division of Extension of Texas Technological College may be credited on the course work for a Master's degree if the student had been officially admitted to the Graduate School (at least as an "Unclassified Student") prior to his enrollment for the extension work. Residence is not credited for extension work.

Not more than 9 semester hours of any combination of extension courses and courses completed elsewhere can be credited toward a Master's degree.

GRADUATE CREDIT IS NEVER GRANTED FOR COURSES TAKEN BY CORRESPONDENCE.

Admission to Candidacy

Every applicant for a Master's degree is required to submit to the Dean of the Graduate School a formal "Application for Admission to Candidacy for the Master's Degree" upon the completion of approximately half of the work listed in his "Program for the Master's Degree." Blanks for this application are obtainable at the Graduate Office.

ALL THE FOLLOWING REQUIREMENTS FOR ADMISSION TO CANDIDACY FOR THE MASTER'S DEGREE MUST BE SATISFIED AT LEAST TWO MONTHS PRIOR TO GRADUATION:

- (1) Official admission to Master's degree work must have been secured.
- (2) At least 12 hours of the graduate work required for the Master's degree must have been completed in residence with an average grade of B or higher.
- (3) The requirement concerning proficiency in English must have been satisfied.
- (4) The requirement in a foreign language (if any) must have been satisfied.
- (5) The general field of the report or thesis must have been approved.
- (6) The work up to this point must be acceptable to the departments concerned, as attested by their approval of the "Application for Admission to Candidacy."
- (7) The entire program must be in conformity with the general regulations of the Graduate School and the requirements for the particular degree.

Time Limit

All work credited toward a Master's degree must be completed within six years. Students whose graduate study here is interrupted by involuntary military service will be granted an extension of time for the period of their military duty, not exceeding five years.

Final Examination

Within the term or semester in which he plans to graduate, at a time specified by his major department, every candidate for a Master's degree is required to undergo a final comprehensive examination in his major field.

The final examination is normally given once each long session and once each summer. It is the student's responsibility to confer with the chairman of his advisory committee or the head of his major department about the time and place of the examination. No reminders will be provided by the departments or the Graduate School.

A student who fails the final examination may repeat it once, but not until after an interval of four months or more.

At the discretion of the department concerned, a student who passes the examination, but does not graduate within 12 months may be required to repeat the examination.

The Doctor's Degree

The requirements set forth in this section are in addition to those listed under "Policies and Regulations."

Majors

Major work leading to the Degree of Doctor of Philosophy is offered in the Departments of Chemistry, English, Geosciences, Government, History, Mathematics, Physics, and Psychology. The Doctor of Philosophy degree is also offered in engineering on an interdisciplinary basis permitting either deep specialization in the Departments of Chemical, Civil, Electrical, Industrial, and Mechanical Engineering, or interdepartmental breadth combined with moderate specialization in a selected field. The Degree of Doctor of Education is offered with a major in Education.

Admission to Doctoral Study

Admission to doctoral study is restricted to applicants whose background shows definite promise of probable success on this the highest level of academic endeavor. The formal requirements for admission to the doctoral program are a distinguished record in previous work (undergraduate and graduate) and a high score on the Aptitude Test of the Graduate Record Examinations. Each doctoral department has additional requirements which applicants must satisfy for admission.

Program of Work

Years of Study

A minimum of three years of graduate study beyond the Bachelor's degree is required for the doctorate. Work completed for the Master's degree is considered one of these years if it forms part of a logical sequence in the entire program.

Work completed in the doctoral program of another recognized graduate school will be considered on the recommendation of the departments concerned, but no assurance can be given that such work will reduce the course or residence requirements in this Graduate School. *In no case can transferred credit reduce the minimum residence* (see below).

Doctoral study cannot be calculated solely in terms of credit hours, but the program for the doctorate normally requires the completion of 60 to 80 or more semester hours of work beyond the Bachelor's degree, exclusive of credit for the dissertation. It is expected that most of the work beyond the Master's degree will be in courses open only to graduate students. (For details concerning registration for the dissertation, see Page 27 of this Bulletin.)

Major and Minor

An applicant for the doctorate will devote most of his time to his major subject, but for the Ph.D. Degree, the program must include a minor of at least 18 semester hours beyond the Bachelor's degree in a department other than the major; and for the Ed.D. Degree, the program must include at least 24 semester hours beyond the Bachelor's degree outside any field of education.

In exceptional circumstances and with special approval, minors at variance with this description may be acceptable.

In addition to any work completed elsewhere in a minor subject, at least 6 semester hours must be completed here in that subject if it is to be considered an official minor.

An applicant for the Ed.D. Degree not having a departmental minor may take as part of his work outside his major those courses which are numbered 5335 but which are not restricted to students in elementary education.

Residence Requirement

These requirements apply to every one beginning doctoral study at Texas Technological College after June 1, 1955, and to those who started earlier than that if they failed to satisfy all requirements with respect to the Graduate Record Examinations by June 1, 1955.

Regardless of the amount of graduate work he may have completed elsewhere, every applicant for the Ed.D. or the Ph.D. Degree is required to complete in residence in this Graduate School at least one year of graduate study beyond the Master's degree or beyond the equivalent of this degree if he proceeds to doctoral work without taking a Master's degree.

This residence may be accomplished in minimum length of time only by the completion of a full schedule of graduate work in each of the two consecutive semesters of a long session. (A full schedule is normally from 12 to 15 semester hours, but, in exceptional circumstances, the Dean may accept a slightly smaller load as full schedule.) A student who holds a teaching or research assistantship or other part-time job closely related to his work toward the doctorate may satisfy the residence requirement at less than full but more than half schedule over a longer period of time including at least three consecutive long session semesters, but only if his plan to do so is approved by the Dean of the Graduate School. No part of this requirement can be satisfied by any type of off-campus enrollment.

Preliminary Examination

As early in his doctoral study as possible, the applicant will undergo a preliminary examination (oral or written or both), administered by the major and minor departments. This examination will serve as the basis of further counseling of the applicant. The major department will file at the Graduate Office a report on this examination and will include a statement concerning the applicant's proficiency in English composition as determined by the major department on the basis of suitable tests.

Languages and Statistics

As indicated in the preceding section, every applicant for the doctorate is required to demonstrate, early in his program, an adequate command of English composition.

In order to qualify for Admission to Candidacy, applicants for the Ph.D. Degree are required to pass reading examinations in two foreign languages acceptable to the major and minor departments and the Dean of the Graduate School. Arrangements for taking these examinations (in French, German and Russian) can be made at the Testing and Counseling Center which administers the tests for the Educational Testing Service. The examinations are given three or four times each year; consult with the Testing and Counseling Center for specific dates.

The Department of Foreign Languages will continue to administer the examination in Spanish, and any acceptable foreign language other than those listed above.

In order to qualify for Admission to Candidacy, applicants for the Ed.D. Degree are required to show competency in educational evaluation and educational statistics and also a foreign language if their research requires such competency. The examination in educational statistics is administered by a committee representing the Department of Education.

Advisory Committee

As soon as an applicant has passed the preliminary examination administered by his major and minor departments, an advisory committee will be appointed by the Dean on the recommendation of the departments concerned. This committee will hold meetings as often as necessary with the applicant and will direct his work at all stages. From time to time, the chairman of the committee will file written reports with the Dean and the heads of the departments concerned, indicating the applicant's progress.

Qualifying Examination

The Qualifying Examination for Admission to Candidacy for the Doctor's degree is one of the major features of the doctoral program. An applicant is eligible to attempt this examination only after he has satisfied the following requirements: (1) he must have been officially admitted to the doctoral program; (2) he must have passed the preliminary examination and have been provisionally accepted by his major and minor departments; and (3) he must have completed most of the course work prescribed by his committee.

The Qualifying Examination is prepared and administered by the candidate's advisory committee and any other professors the committee or the Dean may consider necessary. The major portion of the examination is an essay-type test, of at least six hours' duration. It usually includes also an oral examination under the supervision of the committee and any other professors that may be invited to participate.

Procedure When the Examination Is Satisfactory

If the Qualifying Examination is considered satisfactory and the requirements in languages (including English) and/or statistics have been met, the chairman of the advisory committee will send to the Dean, for consideration by the Graduate Council, a formal written recommendation that the applicant be admitted to candidacy for the Doctor's degree.

Procedure When the Examination Is Not Satisfactory

If the Qualifying Examination is not satisfactory, the chairman of the advisory committee will so notify the Dean, in writing. An applicant who does not pass the Qualifying Examination may be permitted to repeat it once, after a lapse of at least a semester or 15 weeks.

Admission to Candidacy

Authority for admitting an applicant to candidacy for a Doctor's degree is vested in the Graduate Council. Upon receipt of a recommendation from the advisory committee, the Dean will submit it to the Graduate Council for action. The Council may approve the committee's recommendation, or it may, after consultation with the committee, suggest additional requirements which the applicant must satisfy.

By written communication, the Dean will transmit the results of the Council's action to the applicant, to the chairman of his advisory committee, and to the heads of the departments concerned.

Limitation on the Number of Candidates

To insure proper individual attention to each applicant for the doctorate, the Graduate Council limits the number of applicants that will be admitted to candidacy from any department in any one year (Sept. 1 to Aug. 31) to one candidate for each department staff member who holds an earned doctorate and has full membership on the Graduate Faculty.

Time Limit

All work for the doctorate must be completed within four years after the applicant has been admitted to candidacy.

Intervals Between Examinations

At least three months must intervene between the preliminary examination and the qualifying examination and at least six months between the latter and the final examination.

Dissertation

A dissertation is required of every candidate for the doctorate. Details concerning registration for it will be found on Page 27 of this Bulletin.

The subject of the dissertation must be approved by the advisory committee and the Dean at least eight months before the candidate's proposed date of graduation.

The dissertation must demonstrate a mastery of the techniques of research, a thorough understanding of the subject matter and its background, and a high degree of skill in organizing and presenting the material. The dissertation should embody a significant re-evaluation of existing knowledge or some contribution to learning. The work on the dissertation is constantly under the supervision of the advisory committee and any other professors the committee or the Dean may consider necessary.

Available at the Graduate Office, free of charge, is a pamphlet entitled *Instructions for Preparing and Submitting Theses and Dissertations*. All writers and directors of dissertations are expected to have a copy of this pamphlet and follow it carefully.

Three typewritten copies of the dissertation are required by the College. They must be accompanied by two copies of an abstract, *not more than 600 words in length*.

Dissertation Fees

When a doctoral dissertation and its abstract have been approved by a student's advisory committee and accepted by the Dean of the Graduate School, the candidate will pay the College Cashier a "Microfilming and Shipping Charge" of \$25 for the microfilming of the complete dissertation by University Microfilms, Inc., of Ann Arbor, Michigan, and the publication of the abstract in *Dissertation Abstracts*. Other services rendered by University Microfilms, Inc., are explained in the local pamphlet of instructions.

In addition to the fee indicated above, the doctoral candidate will pay to the Texas Tech Press the fee for the binding of the three official typewritten copies of the dissertation. In 1964, this fee is \$3 per copy, but like other fees, it is subject to change without notice as circumstances may require. If he wishes to do so, the student may have additional copies of his dissertation bound at the prevailing rate.

Final Examination

A final oral examination, usually over the general field of the dissertation, is required of every candidate for the doctorate. It may be scheduled at any suitable time after the dissertation (not necessarily the final version) has been approved by the advisory committee. The examination is conducted by the advisory committee under the supervision of the Dean or a professor designated to act in his place. Professors other than members of the student's committee may participate in the examination, but they have no vote in determining the outcome. At the conclusion of the examination, the chairman of the advisory committee will send a written notice to the Graduate Office, giving the result of the examination.

Courses

Informational Details

Limitation of Offerings

Not all of the courses listed in this Bulletin are offered every year. A class schedule, published just before the opening of each term or semester, indicates the courses to be available in that term or semester and the hours at which they will meet. The College reserves the right, however, to cancel any scheduled course, as well as to withdraw any program from the list of graduate offerings, if the best interests of the institution require such action.

Indication of Credit

The number of semester hours' credit for each course is shown immediately following its title, usually in this form: (3:2:3). The first digit in parentheses indicates the number of semester hours' credit which the course carries; the second, the number of lecture hours per week; and the third, the number of laboratory hours per week. If the third digit is zero, the course requires no laboratory work. A single number in parentheses indicates the credit in semester hours.

Prerequisites for Courses

Certain general prerequisites apply to all courses listed in this Bulletin. For example, senior standing is the normal prerequisite for enrollment in a 400 course which carries graduate credit, and graduate standing is a prerequisite for enrollment in any course numbered 500 and above.

Enrollment in any course must be approved by the department offering it.

Departments of Instruction

School of Agriculture

Agricultural Economics

Professor Willard F. Williams
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

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| FOR UNDERGRADUATES AND GRADUATES | 436. World Trade in Agricultural Products. (3:3:0) |
| 430. Special Problems in Agricultural Economics. (3) | 437. Farm and Ranch Appraisal. (3:2:3) |
| May be repeated for credit. | 438. Range and Ranch Economics. (3:3:0) |
| 431. Livestock Marketing. (3:3:0) | 439. Agricultural Prices. (3:3:0) |
| 432. Statistical Methods in Agricultural Research. (3:3:0) | 4311. Agricultural Finance. (3:3:0) |
| 435. Agricultural Policies and Organizations. (3:3:0) | 4312. Mathematical Economics and Econometrics for Agriculture. (3:3:0) |

FOR GRADUATES

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|---|---|
| <p>511. Seminar. (1)</p> <p>531. Advanced Production Economics. (3:3:0)</p> <p>532. Seminar in Agricultural Policy. (3)</p> <p>533. Marketing Problems. (3:3:0)</p> | <p>534. Research in Agricultural Economics. (3)
May be repeated for credit.</p> <p>630. Master's Report. (3)</p> <p>631. Master's Thesis. (3)
Enrollment required at least twice.</p> |
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Agricultural Education

Professor T. L. Leach
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

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|---|--|
| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>434. Methods of Teaching Vocational Agriculture in the High School. (3:2:3)</p> <p>435. Methods in Supervised Farming and Future Farmer Work. (3:2:3)</p> <p>FOR GRADUATES</p> <p>522. Advanced Methods in High School Vocational Agriculture. (2:2:0)</p> <p>523. Advanced Methods in Adult Agricultural Education. (2:2:0)</p> | <p>524. Advanced Methods in Future Farmer Work. (2:2:0)</p> <p>531. Investigation in the Field of Agricultural Education. (3)
May be repeated for credit.</p> <p>535. Problems. (3)
May be repeated for credit.</p> <p>536. Advanced Methods of Teaching Farm Mechanics. (3:3:0)</p> <p>630. Master's Report. (3)</p> <p>631. Master's Thesis. (3)
Enrollment required at least twice.</p> |
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Agricultural Engineering

Professor W. L. Ulich
Head of the Department

MINORS ONLY FOR THE MASTER'S DEGREE

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|---|--|
| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>411. Seminar. (1:1:0)
May be repeated for credit.</p> <p>430. Agricultural Engineering Problems. (3)
May be repeated for credit.</p> <p>433. Elements of Tractor Design. (3:2:3)</p> <p>434. Farm Electrification Systems. (3:2:3)</p> <p>435. Farm Mechanics Problems. (3)
May be repeated for credit.</p> <p>436. Processing and Cotton Gin Engineering. (3:2:3)</p> | <p>437. Design of Farm Irrigation Systems. (3:2:3)</p> <p>438. Structural Design of Farm Buildings. (3:2:3)</p> <p>439. Functional Design of Farm Buildings. (3:2:3)</p> <p>442. Engineering for Soil and Water Conservation. (4:3:3)</p> <p>4311. Advanced Agricultural Mechanics. (3:2:2)</p> <p>FOR GRADUATES</p> <p>531. Investigation in Advanced Agricultural Mechanics.</p> |
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Agronomy and Range Management

Professor A. W. Young
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

Students seeking a Master's degree in Agronomy or Range Management should consult the Head of the Department about their programs before enrolling for any courses.

Before being recommended for admission to candidacy for a Master's degree with a major in this Department, the student may be requested to take a preliminary examination to determine proficiency in background for graduate work, or may be required to take (without graduate credit) such undergraduate levelling courses as may be designated by the Department.

AGRONOMY

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
425. Seed Technology. (2:1:2)	511. Graduate Seminar. (1:1:0) May be repeated for credit.
430. Agronomy Problems. (3) May be repeated for credit.	532. Experimental Design and Analysis. (3:2:2)
431. Fundamental Principles of Plant Breeding. (3:3:0)	533. Pedology. (3:3:0)
433. Cotton Production and Improve- ment. (3:3:0)	534. Research. (3) May be repeated for credit.
434. Soil Conservation and Land Use Planning. (3:2:3)	536. Soil and Plant Relationships. (3:3:0)
435. Soil Classification. (3:2:3)	537. Methods in Plant Breeding. (3:3:0)
436. Soil Chemistry. (3:2:3)	630. Master's Report. (3)
439. Soil Microbiology. (3:2:3)	631. Master's Thesis. (3) Enrollment required at least twice.
4311. Soil Fertility. (3:2:3)	
4313. Weeds and Weed Control. (3:2:2)	
4314. Soil Physics. (3:2:2)	

RANGE MANAGEMENT

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
431. Game Management. (3:2:2)	523. Range Research Methods. (2)
432. Range Management Problems. (3)	531. Comparative Synecology. (3:3:0)
437. Range Management. (3:2:3)	532. Vegetation Influences. (3:3:0)
438. Advanced Range Management. (3:2:3)	534. Range Research. (3) May be repeated for credit.
	630. Master's Report. (3)
	631. Master's Thesis. (3) Enrollment required at least twice.

Animal Husbandry

Professor Ralph M. Durham
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

FOR UNDERGRADUATES AND GRADUATES	
427. Swine Production. (2:2:0)	434. Horse Production. (3:3:0)
431. Beef Cattle Production. (3:3:0)	435. Dairy Cattle Production. (3:3:0)
432. Animal Breeding. (3:3:0)	436. Animal Nutrition. (3:3:0)
	437. Livestock Record Systems. (3:3:0)

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| 439. Endocrinology. (3:3:0) | 536. Biometry. (3) |
| 441. Sheep, Wool, and Mohair Production. (4:3:2) | 537. Advanced Animal Breeding. (3:3:0) |
| | 538. Advanced Animal Nutrition. (3:3:0) |
| | 539. Physiology of Reproduction. (3:2:2) |
| FOR GRADUATES | 541. The Science of Meat and Meat Products. (4:3:3) |
| 511. Graduate Seminar. (1:1:0) | 630. Master's Report. (3) |
| Enrollment required in each semester of student's residence. | 631. Master's Thesis. (3) |
| 533. Techniques in Animal Research. (3) | Enrollment required at least twice. |
| 534. Research in Animal Science. (3:3:0) | |
| May be repeated for credit. | |

POULTRY HUSBANDRY

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| FOR UNDERGRADUATES AND GRADUATES | 433. Caged Egg Production. (3:3:0) |
| 431. Poultry Production. (3:3:0) | FOR GRADUATES |
| 432. Turkey Production. (3:3:0) | (See A.H. 533) |

Dairy Industry

Professor J. J. Willingham
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

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| FOR UNDERGRADUATES AND GRADUATES | 441. Butter and Cheese Making. (4:2:4) |
| 411. Dairy Seminar. (1:1:0) | FOR GRADUATES |
| May be repeated for credit. | 531. Dairy Industry Research. (3) |
| 430. Dairy Industry Problems. (3) | May be repeated for credit. |
| May be repeated for credit. | 535. Dairy Bacteriology Research. (3) |
| 433. Ice Cream and Concentrated Milk. (3:2:3) | May be repeated for credit. |
| 435. Dairy and Food Inspection. (3:2:3) | 630. Master's Report. (3) |
| 437. Creamery Management and Merchandising. (3:3:0) | 631. Master's Thesis. (3) |
| | Enrollment required at least twice. |

Park Administration, Horticulture, and Entomology

Professor E. J. Urbanovsky
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

PARK ADMINISTRATION

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| FOR UNDERGRADUATES AND GRADUATES | 540. Advanced Park Administration. (3:3:0) |
| 422. Park Administration. (2:2:0) | 541. Advanced Park Planning and Design. (4:1:8) |
| 441. Park Planning. (4:1:8) | 542. Advanced Park Planning and Design. (4:1:8) |
| 442. Park Planning. (4:1:8) | 630. Master's Report. (3) |
| FOR GRADUATES | 631. Master's Thesis. (3) |
| 531. Park Administration Research. (3) | Enrollment required at least twice. |
| May be repeated for credit. | |

HORTICULTURE

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| FOR UNDERGRADUATES AND GRADUATES | 430. Horticulture Problems. (3) |
| 425. Horticulture Problems. (2) | May be repeated for credit. |

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| 431. Pomology. (3:3:0) | 532. Horticultural Crop Behavior. (3:3:0) |
| 435. Vegetable Production. (3:3:0) | |
| 436. Advanced Floricultural Science. (3:2:3) | 533. Horticultural Plant Evaluation Techniques. (3:3:0) |
| FOR GRADUATES | |
| 511. Horticulture Seminar. (1:1:0)
May be repeated for credit. | 630. Master's Report. (3) |
| 531. Horticulture Research. (3)
May be repeated for credit. | 631. Master's Thesis. (3)
Enrollment required at least twice. |

ENTOMOLOGY

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| FOR UNDERGRADUATES AND GRADUATES | FOR GRADUATES |
| 334. Insect Morphology. (3:2:3) | 521. Advanced Economic Entomology. (2:2:0) |
| 335. Insect Taxonomy. (3:3:3) | 522. Literature and History of Entomology. (2:2:0) |
| 431. Agricultural Compounds. (3:3:0) | 523. Advanced Insect Taxonomy. (2:0:6) |
| 432. Insect Ecology. (3:2:3) | 531. Entomology Research. (3) |
| 433. Insect Natural History. (3:2:2) | 630. Master's Report. (3) |
| 4311. Medical Entomology. (3:2:3) | 631. Master's Thesis. (3)
Enrollment required at least twice. |
| 4312. Acarology. (3:2:3) | |

School of Arts and Sciences

Biology

Professor E. D. Camp
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND MINORS FOR THE DOCTOR'S DEGREE

Before being recommended for admission to candidacy for the Master's degree with a major in this Department, the student may be required to take a preliminary examination which ordinarily includes the work usually required of undergraduates who major in this Department. If the examination reveals serious weaknesses, the student may be required to take (without graduate credit) such courses as may be designated by the Department.

BACTERIOLOGY

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| FOR UNDERGRADUATES AND GRADUATES | |
| 331. General Bacteriology. (3:2:3) | 431. Problems in Bacteriology. (3:3:0) |
| 333. Communicable Diseases. (3:3:0) | 432. Immunology and Serology. (3:2:3) |
| 334. Bacteriology of Foods and Food Sanitation. (3:2:3) | 433. Physiology of Bacteria. (3:2:3) |
| 430. Advanced General Bacteriology (3:2:3) | 434. Pathogenic Bacteriology. (3:2:3) |
| | 531. Research in Microbiology. (3:0:9) |
| | 532. Selected Topics in Microbiology. (3:3:0) |

BIOLOGY

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| FOR UNDERGRADUATES AND GRADUATES | |
| 331. Heredity. (3:3:0) | 511. Seminar. (1:1:0) |
| 332. Teaching of Biology. (3:3:0) | 512. Advanced Experimental Heredity. (1:0:3) |
| 333. Bio-Ecology. (3:2:3) | 532. Population Genetics. (3:2:3) |
| 431. Biological Techniques. (3:0:9) | |

BOTANY

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>331. Plant Physiology. (3:2:3)</p> <p>322. Plant Pathology. (3:2:3)</p> <p>339. Plant Anatomy. (3:2:3)</p> <p>435. Advanced Taxonomy. (3:0:9)</p> <p>436. Plant Geography. (3:3:0)</p> <p>437. Problems In Plant Geography. (3:3:0)</p> <p>438. Morphology of Fungi. (3:2:3)</p> <p style="text-align: center;">FOR GRADUATES</p> <p>531. Problems in Botany. (3)</p> <p style="padding-left: 2em;">May be repeated for credit.</p> | <p>534. Advanced Plant Anatomy. (3:0:9)</p> <p>535. Field Botany. (3:3:0)</p> <p style="padding-left: 2em;">May be repeated for credit.</p> <p>536. Taxonomy of Lower Green Plants. (3:2:3)</p> <p>537. Morphology of The Vascular Plants. (3:2:3)</p> <p>630. Master's Report. (3)</p> <p>631. Master's Thesis. (3)</p> <p style="padding-left: 2em;">Enrollment required at least twice.</p> |
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ENTOMOLOGY

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>334. Insect Morphology. (3:2:3)</p> <p>335. Insect Taxonomy. (3:2:3)</p> <p>431. Agricultural Compounds. (3:3:0)*</p> <p>432. Insect Ecology. (3:2:3)</p> <p>433. Insect Natural History. (3:2:3)</p> <p>4311. Medical Entomology. (3:2:3)</p> <p>4312. Acarology. (3:2:3)</p> | <p>FOR GRADUATES</p> <p>521. Advanced Economic Entomology. (2:2:0)*</p> <p>522. Literature and History of Entomology. (2:2:0)</p> <p>523. Advanced Insect Taxonomy. (2:0:6)</p> |
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ZOOLOGY

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>331. Animal Histology. (3:2:4)</p> <p>332. Comparative Vertebrate Embryology. (3:2:4)</p> <p>333. Parasitology. (3:2:3)</p> <p>336. Comparative Invertebrate Zoology. (3:2:3)</p> <p>435. Cytology. (3:2:3)</p> <p>437. Natural History of The Vertebrates. (3:2:3)</p> <p>438. Cellular Physiology. (3:2:3)</p> <p>439. Comparative Animal Physiology. (3:2:3)</p> <p>4312. Advanced Parasitology. (3:2:3)</p> | <p>FOR GRADUATES</p> <p>531. Problems in Zoology. (3)</p> <p style="padding-left: 2em;">May be repeated for credit.</p> <p>532. Principles and Methods of Systematic Zoology. (3:2:3)</p> <p>533. Herpetology. (3:2:3)</p> <p>535. Field Zoology. (3:0:9)</p> <p style="padding-left: 2em;">May be repeated for credit.</p> <p>536. Mammalogy. (3:2:3)</p> <p>630. Master's Report. (3)</p> <p>631. Master's Thesis. (3)</p> <p style="padding-left: 2em;">Enrollment required at least twice.</p> |
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Chemistry

Professor Joe Dennis
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

Each student majoring in this department for an advanced degree must take written preliminary diagnostic examinations to ascertain his comprehension of chemistry. The examinations are based on the undergraduate curriculum. Each student is expected

* Courses offered in the Department of Park Administration, Horticulture and Entomology, School of Agriculture.

to take examinations in analytical, inorganic, organic, and physical chemistry. Those students who have a special interest in biochemistry will take the aforementioned examinations and one in biochemistry also. These examinations are given during the first week of each semester, according to schedules posted on the departmental bulletin board. Students will have an opportunity to register for such remedial courses as the examinations may show to be necessary.

Special Regulations Concerning the Master's Degree

At least one semester before graduation, every applicant for the Master's degree in this Department must pass a reading examination in a foreign language acceptable to this Department. The examination will be given in accordance with the procedures indicated on Page 31 of this Bulletin.

Special Regulations Concerning the Doctor's Degree

Credit for the research presented in the doctoral dissertation in this Department shall constitute not less than one-sixth nor more than one-third of the total work presented for the degree.

At least 18 semester hours of work must be done outside this Department.

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| 342. Physiological Chemistry. (4:3:3)* | 5304. Selected Topics in Inorganic Chemistry. (3:3:0)
May be repeated for credit. |
| 343. Introductory Physical Chemistry. (4:3:3)* | 5305. Inorganic Preparations. (3) |
| 347-348. Physical Chemistry. (4:3:3 each)* | 5314. Advanced Analytical Chemistry. (3) |
| 353-354. Organic Chemistry. (5:3:6 each)* | 5315. Spectrographic Analysis I. Emission Spectra. (3:2:3) |
| FOR UNDERGRADUATES AND GRADUATES** | |
| 420. Chemical Literature. (2:2:0) | 5316. Spectrographic Analysis II. Absorption Spectra. (3:2:3) |
| 431. Qualitative Organic Analysis. (3:1:6) | 5321. Advanced Organic Chemistry I. (3:3:0) |
| 432. Structure and Mechanisms of Organic Chemistry. (3:3:0) | 5322. Advanced Organic Chemistry II. (3:3:0) |
| 435. Inorganic Chemistry. (3:3:0) | 5325. Selected Topics in Organic Chemistry. (3:3:0)
May be repeated for credit. |
| 436. Biological Chemistry I. (3:2:3) | 5327. Physical Organic Chemistry I. (3:3:0) |
| 437. Biological Chemistry II. (3:2:3) | 5328. Physical Organic Chemistry II. (3:3:0) |
| 438. Valency and Molecular Structure. (3:3:0) | 5334. Selected Topics in Biological Chemistry. (3:3:0)
May be repeated for credit. |
| 4312. Instrumental Analytical Methods. (3:2:3) | 5335. Physical Biochemistry. (3:3:0) |
| FOR GRADUATES | |
| 511-512. Graduate Seminar. (1:1:0 each)
May be repeated for credit. | 5342. Advanced Physical Chemistry. (3:3:0) |
| 5117. Selected Topics in Analytical Chemistry. (1:1:0)
May be repeated for credit. | 5343. Quantum Chemistry. (3:3:0) |
| 531-532. Individual Research Problems. (3 each)
May be repeated for credit. | 5344. Kinetics of Chemical Reactions. (3:3:0) |
| 5301. Advanced Inorganic Chemistry I. (3:3:0) | 5345. X-Rays and Crystal Structure. (3:3:0) |
| 5302. Advanced Inorganic Chemistry II. (3:3:0) | 5346. Statistical Mechanics for Chemists. (3:3:0) |

* Can be used by graduate students for minor credit only.

** Normally for graduate minor credit only.

5347. Chemical Thermodynamics. (3:3:0)
 5348. Selected Topics in Physical Chemistry. (3:3:0)
 May be repeated for credit.
 630. Master's Report (3)
631. Master's Thesis. (3)
 Enrollment required at least twice.
 831. Doctor's Dissertation. (3)
 Enrollment required at least four times.

Education and Philosophy

Professor Morris S. Wallace
 Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND MAJORS FOR THE DEGREE OF DOCTOR OF EDUCATION AND MINORS IN EDUCATION FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

The program leading to certification as a counselor in the public schools is a joint enterprise of the Departments of Education and Psychology. Students interested in this program are invited to write to the head of either of these Departments for details.

EDUCATION

FOR UNDERGRADUATES AND GRADUATES

430. History and Philosophy of Education. (3:3:0)
 438. Educational Measurement and evaluation. (3:3:0)
 4331. Foundations of Educational Sociology. (3:3:0)
 4338. Foundations of Special Education. (3:3:0)
 4339. Teaching the Exceptional Child. (3:3:0)
 4344. Children's Literature. (3:3:0)

FOR GRADUATES

5139. Advanced Education Workshops in Teaching and Administration. (1-6)
 May be repeated for a maximum of six hours' credit.
 530. Advanced Educational Psychology. (3:3:0)
 532. Philosophy of Education. (3:3:0)
 533. General Public School Administration. (3:3:0)
 534. Advanced Educational Sociology. (3:3:0)
 536. Elementary School Administration. (3:3:0)
 537. Secondary School Administration. (3:3:0)
 538. Administration of Audio-Visual Services. (3:3:0)
 539. Administration of School Business Services. (3:3:0)
 5311. Audio-Visual Education. (3:3:0)
 5312. Supervision in the Elementary School. (3:3:0)
 5313. Supervision in the Secondary School. (3:3:0)

5316. The Junior College. (3:3:0)
 5317. The Junior High School. (3:3:0)
 5318. Selection and Evaluation of Audio-Visual Materials. (3:3:0)
 5319. Audio-Visual Production. (3:3:0)
 5321. Individual Study in Education. (3:3:0)
 5322. Foundations of Educational Research. (3:3:0)
 5323. Advanced Educational Statistics. (3:3:0)
 5325. Legal Bases of Education. (3:3:0)
 5326. Reading Development in the Elementary School. (3)
 5331. Human Development in Education. (3:3:0)
 5334. Teaching Reading in the Secondary School. (3:3:0)
 5341. Developing Arithmetic Programs in Elementary Education. (3:3:0)
 5342. Developing Reading Programs in Elementary Education. (3:3:0)
 5343. Developing Natural and Physical Environment Concepts in Elementary Education. (3:3:0)
 5344. Developing Language Arts Programs in Elementary Education. (3:3:0)
 5345. Developing Social Studies Programs in Elementary Education. (3:3:0)
 5346. Advanced Curriculum Development. (3:3:0)
 5349. Organizing and Administering the Instructional Improvement Program. (3:3:0)
 5351. General Education Seminar. (3:3:0)
 5353. Comparative Education. (3:3:0)
 5354. Seminar in Educational Sociology. (3:3:0)

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| 5355. Seminar in Elementary Education. (3:3:0) | 5371. General Supervision. (3:3:0) |
| 5356. Seminar in Secondary Education. (3:3:0) | 5372. Developing the School Guidance Program. (3:3:0) |
| 5357. The Administration of the Junior College (3:3:0) | 5373. Educational Evaluation. (3:3:0) |
| 5359. Seminar in Supervision. (3:3:0) | 630. Master's Report. (3) |
| 5363. Problems in Audio-Visual Education. (3:3:0) | 631. Master's Thesis. (3) |
| 5364. Seminar in Educational Psychology. (3:3:0) | Enrollment required at least twice. |
| 5366. The Administration of School Staff Personnel. (3:3:0) | 661. Internship in Educational Administration. (6) |
| 5367. School Finance. (3:3:0) | 662. Internship in Educational Administration. (6) |
| 5368. School Housing. (3:3:0) | 731-732. Research. (3 each) |
| 5369. School Public Relations. (3:3:0) | 831. Doctor's Dissertation. (3) |
| | Enrollment required at least four times. |

PHILOSOPHY

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| FOR UNDERGRADUATES AND GRADUATES | 431. Aesthetics. (3:3:0) |
| 331. History of Ancient and Medieval Philosophy. (3:3:0) | 432. Philosophy of Value. (3:3:0) |
| 332. History of Modern Philosophy. (3:3:0) | 436. Philosophy of Religion. (3:3:0) |
| 333. Development of American Philosophy. (3:3:0) | 438. Seminar in Philosophical Problems. (3:3:0) |
| 335. Oriental Philosophies. (3:3:0) | |
| 336. Philosophy of Science. (3:3:0) | FOR GRADUATES |
| | 535. Basic Issues in Contemporary Philosophy. (3:3:0) |

English

Professor John C. Guilds
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

Students seeking the Master's degree in English should consult the Director of Graduate Studies about their program before enrolling for any courses.

Before being recommended for admission to candidacy for the Master's degree in this Department, every applicant must pass a reading examination in a foreign language acceptable to the Department. This examination will be given in accord with the procedures indicated on Page 31 of this Bulletin.

Upon completing his work for the Master's degree or near the conclusion of his first full year of graduate study, the student who plans to work toward the doctorate in English will be given a preliminary comprehensive examination to determine his degree of proficiency.

An applicant for the doctorate in English will select one of eight fields in English literature, American literature, comparative literature, or linguistics as his dissertation area and include within his specialization four of the other fields of English study, selected with the approval of his advisory committee. The student should consult the Director of Graduate Studies in English about determining an appropriate graduate minor.

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| FOR UNDERGRADUATES AND GRADUATES* | 438. History of the English Language. (3:3:0) |
| 433. Chaucer. (3:3:0) | 439. American English. (3:3:0) |
| 434. Milton and His Age. (3:3:0) | |

* Normally credit for graduate minors only.

4331. Pre-Shakespearean Drama. (3:3:0)
 4333. Philosophical Ideas in Literature. (3:3:0)
 4336. Teaching of English in Secondary Schools. (3:3:0)
 4337. English Literary History: A Synthesis. (3:3:0)
 4341. Regional Literature of the United States. (3:3:0)
 4343. Modern American and European Drama. (3:3:0)
 4349. Ancient and Medieval Literature. (3:3:0)
 4355. Modern Continental Literature. (3:3:0)
- FOR GRADUATES*
530. Studies in Medieval Literature. (3:3:0)
 531. Studies in Comparative Literature.
 532. Teaching of College English. (3:3:0)
 533. Studies in Renaissance Literature. (3:3:0)
 534. Old English. (3:3:0)
 535. Studies in Early Victorian Literature. (3:3:0)
 538. Studies in Early English Romantics. (3:3:0)
 539. Studies in the Neo-Classical Age. (3:3:0)
 5311. Studies in Seventeenth Century Literature. (3:3:0)
5312. Studies in Drama. (3:3:0)
 5314. Studies in Literary Criticism. (3:3:0)
 5319. Studies in Shakespeare. (3:3:0)
 5322. Studies in Modern British Literature. (3:3:0)
 5323. American Literature to 1865. (3:3:0)
 5324. American Literature since 1865. (3:3:0)
 5325. American Novel to 1900. (3:3:0)
 5326. American Novel since 1900. (3:3:0)
 5329. Studies in Modern Poetry. (3:3:0)
 5335. Principles of Language. (3:3:0)
 5337. Studies in Linguistics. (3:3:0)
 5351. Studies in Later Victorian Literature. (3:3:0)
 5381. Studies in Later English Romantics. (3:3:0)
 5391. Studies in the Age of Johnson. (3:3:0)
 630. Master's Report. (3)
 631. Master's Thesis. (3)
 Enrollment required at least twice.
 636. Seminar in Nineteenth Century American Literature. (3:3:0)
 637. Seminar in Twentieth Century American Literature. (3:3:0)
 731, 732. Research. (3 each)
 831. Doctor's Dissertation. (3)
 Enrollment required at least four times.

Foreign Languages

Professor Harley D. Oberhelman
 Head of the Department

MINORS ONLY FOR THE DOCTOR'S DEGREE

FRENCH

MINORS ONLY FOR THE MASTER'S DEGREE

- FOR UNDERGRADUATES AND GRADUATES
430. Advanced Grammar, Composition, and Conversation. (3:3:0)
 433. The Literature of the Nineteenth Century. (3:3:0)
 434. The Literature of the Nineteenth Century. (3:3:0)
 435. Readings in French Language and Literature I. (3:3:0)
436. Readings in French Language and Literature II. (3:3:0)
 4311. The Classical Theater. (3:3:0)
 4312. Eighteenth Century Literature. (3:3:0)
 4315. A Survey of French Classics I. (3:3:0)
 4316. A Survey of French Classics II. (3:3:0)
 4321. Phonetics and Diction. (3:3:0)

* Graduate courses may be repeated for credit with permission of department as topics vary.

GERMAN

MINORS ONLY FOR THE MASTER'S DEGREE

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| FOR UNDERGRADUATES AND GRADUATES | 436. Readings in German Language and Literature II. (3:3:0) |
| 431. Advanced Grammar, Composition, and Conversation. (3:3:0) | 4311. Eighteenth Century Literature. (3:3:0) |
| 432. Structure of the German Language. (3:3:0) | 4312. Goethe. (3:3:0) |
| 433. Nineteenth Century Drama. (3:3:0) | 4315. A Survey of German Literature I. (3:3:0) |
| 434. Nineteenth Century Prose and Poetry. (3:3:0) | 4316. A Survey of German Literature II. (3:3:0) |
| 435. Readings in German Language and Literature I. (3:3:0) | |

LATIN

MINORS ONLY FOR THE MASTER'S DEGREE

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| FOR UNDERGRADUATES AND GRADUATES | 436. Readings in Latin Literature II. (3:3:0) |
| 431. Advanced Composition and Grammar Review. (3:3:0) | May be repeated for credit. |
| 435. Readings in Latin Literature I. (3:3:0) | |
| May be repeated for credit. | |

SPANISH

MAJORS AND MINORS FOR THE MASTER'S DEGREE

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| FOR UNDERGRADUATES AND GRADUATES | 4325. Readings in Spanish American Literature and Civilization. (3:3:0) |
| 431. Nineteenth Century Prose. (3:3:0) | 4326. Survey of Spanish American Literature. (3:3:0) |
| 432. Nineteenth Century Prose. (3:3:0) | 4327. Survey of Spanish American Literature. (3:3:0) |
| 433. Modern Drama and Poetry. (3:3:0) | 4328-4329. Spanish Civilization. (3:3:0 each) |
| 434. Modern Drama and Poetry. (3:3:0) | Offered in alternate summers in Mexico City. |
| 436. Advanced Composition and Conversation. (3:3:0) | |
| 437. Advanced Grammar and Composition. (3:3:0) | |
| 4312. The Prose of the Golden Age. (3:3:0) | |
| 4313. The Prose of the Golden Age. (3:3:0) | |
| 4314. The Drama of the Golden Age. (3:3:0) | |
| 4315. The Drama of the Golden Age. (3:3:0) | |
| 4316. A Survey of Spanish Literature. (3:3:0) | |
| 4317. A Survey of Spanish Literature. (3:3:0) | |
| 4318. Readings in Contemporary Spanish Literature. (3:3:0) | |
| 4319. Readings in Contemporary Spanish Literature (3:3:0) | |
| 4324. Readings in Spanish American Literature and Civilization (3:3:0) | |
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|--|---|
| | FOR GRADUATES |
| | 5312. Studies in Spanish and Spanish American Literature. (3:3:0) |
| | May be repeated for credit. |
| | 5313. Studies in Spanish and Spanish American Literature. (3:3:0) |
| | May be repeated for credit. |
| | 5335. Spanish in the Elementary School. (3:3:0) |
| | 541-542. Summer Language Institute. (4:21:25 each) |
| | 630. Master's Report (3) |
| | 631. Master's Thesis. (3) |
| | Enrollment required at least twice. |

METHODS

FOR UNDERGRADUATES AND GRADUATES

4311. Teachers' Course in Methods of Teaching Foreign Languages. (3:3:0)

FOR GRADUATES

5311. Laboratory Techniques in Foreign Language Teaching. (3:3:0)

Geosciences

Professor F. A. Wade
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

Departmental Regulations Concerning the Master's Degree

Before being recommended for admission to candidacy for the Master's degree in this Department, the student must satisfy the graduate staff that he is qualified. Students may be required to take written qualifying examinations in one or more of the following subjects: physical geology, historical geology, mineralogy and crystallography, structural geology, paleontology and field methods. Examinations will be given during the first week of each semester and students will have the opportunity to register for the remedial courses which are recommended.

Advanced Physical and Historical Geology (Geology 531-532) is required of all candidates for graduate degrees.

Regulations Concerning the Doctor's Degree

The basic regulations and requirements for the Degree of Doctor of Philosophy determine the policy of this Department. Not more than 12 semester hours for the research presented in the doctoral dissertation will be credited towards fulfillment of the total requirements for the degree. The Department recommends that the requirements for a reading knowledge of foreign languages be fulfilled in two of the following: German, Russian, French.

GEOLOGY

FOR UNDERGRADUATES AND GRADUATES

- 431-432. Optical Mineralogy and Petrology. (3:1:6 each)
433. Petroleum Geology. (3:3:0)
434. Petroleum Geology. (3:2:3)
435. Stratigraphic Paleontology. (3:2:3)
436. Micropaleontology. (3:1:5)
437. Sedimentation. (3:3:0)
439. Vertebrate Paleontology. (3:2:3)
4314. Principles of Stratigraphy. (3:3:0)
4315. Paleozoic, Mesozoic, Cenozoic Stratigraphy. (3:3:0)
4316. Aerial Photo Interpretation. (3:2:3)

FOR GRADUATES

511. Graduate Seminar. (1:1:0)
Required of all graduate students majoring in this department.
521. Clay Mineralogy. (2:1:3)
531-532. Advanced Physical and Historical Geology. (3:3:0 each)
533. Petrology of Igneous Rocks. (3:3:0)

534. Petrology of Metamorphic Rocks. (3:3:0)

- 535-536. Advanced Work in Specific Fields. (3 each)

5311. Stratigraphic Micropaleontology. (3:3:0)

5312. Economic Geology. (3:2:3)

5324. Advanced Sedimentation. (3:2:3)

5327. Problems in Paleontology. (3:2:3)

5328. Advanced Structural Geology. (3:2:3)

541. X-Ray Diffraction and Analysis. (4:3:4)

542. X-Ray Crystallography. (4:3:4)

563. Advanced Field Geology. (6)

631. Master's Thesis. (3)

- Enrollment required at least twice.

- 731, 732. Research. (3 each)

831. Doctor's Dissertation. (3)

- Enrollment required at least four times.

MINORS ONLY FOR THE MASTER'S DEGREE

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| 332. Structural Geology. (3:2:3) | 337. Ground Water. (3:3:0) |
| 335-336. General Paleontology. (3:2:3) | Graduate credit with approval of
Department Head and Graduate
Dean. |
| | 363. Field Geology. (6) |

GEOCHEMISTRY

FOR UNDERGRADUATES AND GRADUATES

4331. Geochemistry I. (3:3:0)
4332. Geochemistry II. (3:3:0)

FOR GRADUATES

533. Selected Topics in Geochemistry.
(3:3:0)
534. Advanced Problems in Geochemistry.
(3:1:6)

GEOPHYSICS

FOR UNDERGRADUATES AND GRADUATES

4321. Earthquake Seismology.
(3:2:3)
4322. The Earth's Gravity Field.
(3:3:0)
4323. Applications in Geophysics.
(3:1:6)

FOR GRADUATES

531. Wave Propagation in Layered Media.
(3:3:0)
533. Selected Topics in Geophysics.
(3:3:0)
534. Advanced Problems in Geophysics.
(3:1:6)

MINORS ONLY FOR THE MASTER'S DEGREE

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|---|--|
| 3321. Geophysical Methods, Gravity and
Magnetic. (3:3:0) | 3322. Geophysical Method, Seismic and
Electrical. (3:3:0) |
|---|--|

GEOGRAPHY

FOR UNDERGRADUATES AND GRADUATES

331. General Meteorology. (3:2:3)

332. Practical Meteorology. (3:2:3)

Government

Professor J. William Davis
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

FOR UNDERGRADUATES AND GRADUATES

4321. Local Government. (3:3:0)
4322. State Government. (3:3:0)
4323. Legislation. (3:3:0)
4324. Government and the Economy.
(3:3:0)
4325. Political Parties. (3:3:0)
4326. Intergovernmental Relations.
(3:3:0)
4331. Ancient and Medieval Political
Theory. (3:3:0)
4332. Modern Political Theory. (3:3:0)
4333. Contemporary Political Theory.
(3:3:0)
4334. American Political Theory. (3:3:0)
4341. Fiscal Administration. (3:3:0)

4342. Personnel Administration. (3:3:0)

4343. Local Administration. (3:3:0)
4344. Metropolitan Areas. (3:3:0)
4345. Administrative Organization and
Management. (3:3:0)
4346. Policy and Administration. (3:3:0)
4351. Constitutional Law, Powers. (3:3:0)
4352. Constitutional Law, Limitations.
(3:3:0)
4353. Administrative Law and Regulation.
(3:3:0)
4354. Jurisprudence. (3:3:0)
4361. United States Foreign Policy.
(3:3:0)
4362. Political Geography. (3:3:0)
4363. International Organization. (3:3:0)

4364. International Law. (3:3:0)
 4365. Problems in National Security. (3:3:0)
 4371. Teaching Social Science in the High School. (3:3:0)
 May be counted as Government or Education.
 4372. Government of the Union of Soviet Socialist Republics. (3:3:0)
 4373. Governments of Western Europe. (3:3:0)
 4374. Government of Mexico. (3:3:0)
 4375. Major South American Governments. (3:3:0)
 4376. Major Governments of Asia. (3:3:0)
 4377. African Governments and Politics. (3:3:0)
 4378. Middle Eastern Governments and Politics. (3:3:0)
 4379. British Government. (3:3:0)
- FOR GRADUATES
531. Readings and Research. Individual Study. (3:3:0)
 May be repeated for credit.
 532. Seminar in American Government. (3:3:0)
533. Seminar in Political Theory. (3:3:0)
 534. Seminar in Public Administration. (3:3:0)
 535. Seminar in Public Law. (3:3:0)
 536. Seminar in International Relations. (3:3:0)
 537. Seminar in Comparative Government and Politics. (3:3:0)
 539. Seminar in National Security Affairs. (3:3:0)
 5321. Advanced American Government and Politics. (3:3:0)
 5331. Advanced Political Theory. (3:3:0)
 5341. Advanced Public Administration. (3:3:0)
 5351. Advanced Constitutional Law. (3:3:0)
 5361. Advanced International Relations. (3:3:0)
 5371. Advanced Comparative Government. (3:3:0)
 631. Master's Thesis. (3)
 Enrollment required at least twice.
 713, 732. Research. (3 each)
 831. Doctoral Dissertation. (3)
 Enrollment required at least four times.

Health, Physical Education, and Recreation for Men

Professor R. W. Kireilis
 Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

Unless otherwise specified, all courses are open to both men and women.

- | FOR UNDERGRADUATES AND GRADUATES | FOR GRADUATES |
|--|---|
| 431. Kinesiology. (3:3:0) | 531. Administration of Physical Education. (3:3:0) |
| 432. Physiology of Exercise. (3:3:0) | 532. Supervision of Physical Education. (3:3:0) |
| 434. Principles of Physical Education. (3:3:0) | 533. Facilities for Physical Education. (3:3:0) |
| 436. Physical Examinations and Corrective Physical Education. (3:3:0) | 534. Administration of the School Health Program. (3:3:0) |
| 437. Measurements in Physical Education. (3:3:0) | 535. Techniques of Research in Health, Physical Education, and Recreation. (3:3:0) |
| 438. Curriculum Development in Physical Education. (3:3:0) | 536. Problems in Health, Physical Education and Recreation. (3:3:0) |
| 439. Organization and Administration of Recreational Programs. (3:3:0) | 5322. Organization and Administration of Interscholastic and Intercollegiate Athletic Programs. (3:3:0) |
| 4321. Methods and Techniques of Driver Instruction. (3:3:2)
Special fee, \$12.50. | 5324. Organization and Administration of Intramural Sports. (3:3:0) |
| 4323. Organization and Administration of Camps. (3:3:0) | 630.. Master's Report. (3) |
| 4326. Safety Education. (3:3:2) | 631. Master's Thesis. (3)
Enrollment required at least twice. |

Health, Physical Education, and Recreation for Women

Professor Mary B. Dabney
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

Unless otherwise specified, all courses are open to both men and women.

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
431. Kinesiology. (3:3:0)	531. Administration of Physical Education. (3:3:0)
432. Physiology of Exercise. (3:3:0)	532. Supervision of Physical Education. (3:3:0)
434. Principles of Physical Education. (3:3:0)	533. Facilities for Physical Education. (3:3:0)
436. Physical Examinations and Corrective Physical Education. (3:3:0)	534. Administration of the School Health Program. (3:3:0)
437. Measurements in Physical Education. (3:3:0)	535. Techniques of Research in Health, Physical Education, and Recreation. (3:3:0)
438. Curriculum Development in Physical Education. (3:3:0)	536. Problems in Health, Physical Education, and Recreation. (3:3:0) May be repeated for credit.
439. Organization and Administration of Recreation Programs. (3:3:0)	630. Master's Report. (3)
4311. Physical Education for the Junior and Senior High School. (3:3:0)	631. Master's Thesis. (3) Enrollment required at least twice.
4321. Methods and Techniques of Driver Instruction. (3:3:2) Special fee, \$12.50.	
4323. Organization and Administration of Camps. (3:3:0)	
4326. Safety Education. (3:3:2)	

History

Professor D. M. Vigness
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND THE DOCTOR'S DEGREE**Departmental Regulations Governing The Doctoral Program**

In his preliminary examination, the applicant will be examined in five fields including two in American and two in foreign areas. In his qualifying examination, he must demonstrate a mastery of five fields, three in American (including his dissertation field), and two in foreign history (one of which may be Latin-American). At the discretion of the advisory committee, the examination in one field may be waived. Fields may be offered from the following:

American: Early American to 1815; The Middle Period, 1815-1890; Recent American; Social and Cultural; Constitutional; Diplomatic; Southern; Frontier and Western; and Latin-American.

Foreign: Classical Civilization through the Renaissance; Early Modern European (the Renaissance to 1789); Modern European (1789 to the present); England and the British Empire; and Afro-Asian.

Applicants for the doctorate in other departments who choose history as a minor must show proficiency in one or more of the above fields.

The applicant will be guided in his program by the graduate adviser of the department until the appointment of the advisory committee.

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
430. English Colonial America. (3:3:0)	433. Constitutional History of the United States since 1865. (3:3:0)
432. Constitutional History of the United States to 1865. (3:3:0)	434. Early National Period in the United States, 1783-1815. (3:3:0)

436. Social and Cultural History of the United States to 1865. (3:3:0)
437. Social and Cultural History of the United States since 1865. (3:3:0)
4311. The Old South. (3:3:0)
4312. The South since the Civil War. (3:3:0)
4321. Colonial South America. (3:3:0)
4322. South America since Independence. (3:3:0)
4323. Spanish North America. (3:3:0)
4324. Mexico since Independence. (3:3:0)
4327. The American Frontier to 1803. (3:3:0)
4328. The Trans-Mississippi West from 1803. (3:3:0)
4331. History and Ideas of American Science and Scientists. (3:3:0)
4332. History of Theology in America. (3:3:0)
4344. Tudor England. (3:3:0)
4345. Stuart England. (3:3:0)
4346. Twentieth Century Britain. (3:3:0)
4347. Constitutional History of England. (3:3:0)
4349. The British Empire. (3:3:0)
4351. The Near East in Modern Times. (3:3:0)
4354. The Far East. (3:3:0)
4355. Africa. (3:3:0)
4359. History of Russia. (3:3:0)
4361. Classical Civilizations: Greece and Rome. (3:3:0)
4362. Medieval Civilizations. (3:3:0)
4363. The Renaissance. (3:3:0)
4364. Europe, The Age of Absolutism and the Old Regime. (3:3:0)
4365. The French Revolution and Napoleon. (3:3:0)
4366. Europe, 1815-1870. (3:3:0)
4367. Europe, 1870-1918. (3:3:0)
4368. Europe since 1918. (3:3:0)
4371. Teaching Social Studies in the High School. (3:3:0)
4372. The Reformation. (3:3:0)
- FOR GRADUATES
- (Graduate courses may be repeated for credit with departmental consent.)
531. Proseminar in Texas History. (3:3:0)
534. Historical Methods and Historiography. (3:3:0)
5311. Studies in Southern United States History. (3:3:0)
5312. Studies in Recent United States History. (3:3:0)
5313. Studies in United States Social and Cultural History. (3:3:0)
5314. Studies in the Frontier and Western American History. (3:3:0)
5315. Problems in American History. (3:3:0)
5316. Studies in Modern European History. (3:3:0)
5317. Studies in Medieval History. (3:3:0)
5318. Studies in the Renaissance and Reformation. (3:3:0)
5319. Studies in Afro-Asian History. (3:3:0)
5321. Studies in British History. (3:3:0)
5322. Studies in United States Diplomatic History. (3:3:0)
5323. Studies in American Constitutional History. (3:3:0)
5335. History Appreciation for Teachers. (3:3:0)
631. Master's Thesis. (3)
Enrollment required at least twice.
633. Seminar in Southwestern History. (3:3:0)
634. Seminar in American History. (3:3:0)
635. Seminar in European History. (3:3:0)
636. Seminar in Latin American History. (3:3:0)
- 731, 732. Research. (3 each)
831. Doctoral Dissertation. (3)
Enrollment required at least four times.

Journalism

Professor Wallace E. Garets
Head of the Department

MINORS ONLY FOR THE MASTER'S DEGREE

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>338, 339. Editing. (3:2:3 each)</p> <p>411. Special Problems in Journalism. (1)
May be repeated for credit.</p> | <p>430. Law of the Press. (3:3:0)</p> <p>432. Journalism for the High School Teacher. (3:3:0)</p> |
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433. Public Opinion and Propaganda. (3:3:0)
May be taken for psychology credit.
436. Public Opinion and Public Issues. (3:3:0)
4311. Public Affairs Reporting. (3:3:0)
4314. Seminar. (3:3:0)

Mathematics

Professor Emmett A. Hazlewood
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND THE DOCTOR'S DEGREE

- | FOR UNDERGRADUATES AND GRADUATES | FOR GRADUATES |
|---|---|
| 430. Synthetic Projective Geometry. (3:3:0) | 511, 512. Graduate Seminar. (1:1:0 each) |
| 431. Teaching of Mathematics in the Secondary Schools. (3:3:0)
Only those students working toward teacher certification may use credit in this course toward minimum requirements for the mathematics major. | 531. Advanced Problems. (3:3:0) |
| 432. Advanced Differential Equations. (3:3:0) | 536, 537. Modern Algebra. (3:3:0 each) |
| 434, 435. Advanced Calculus. (3:3:0 each) | 538. Foundations of Mathematics. (3:3:0) |
| 437. Theory of Numbers. (3:3:0) | 5312, 5313. Theory of Functions of a Complex Variable. (3:3:0 each) |
| 438. Solid Analytic Geometry. (3:3:0) | 5314, 5315. Functions of a Real Variable. (3:3:0 each) |
| 4312. Numerical Mathematical Analysis. (3:3:0) | 5316, 5317. Topology. (3:3:0 each) |
| 4313. Probability. (3:3:0) | 5321, 5322. Methods of Applied Mathematics. (3:3:0 each) |
| 4314, 4315. Mathematical Statistics. (3:3:0 each) | 5323, 5324. Theory of Ordinary Differential Equations I. II. (3:3:0 each) |
| 4316. Introductory Point-Set Topology. (3:3:0) | 5325, 5326. Partial Differential Equations I, II. (3:3:0 each) |
| 4317. Actuarial Mathematics. (3:3:0) | 5331, 5332. Advanced Topics in Analysis I, II. (3:3:0 each) |
| 4318. Finite Mathematical Structure. (3:3:0) | 5335, 5336. Advanced Mathematics for Teachers. (3:3:0 each) |
| 4319. Elementary Functions of Complex Variables. (3:3:0) | 5341, 5342. Advanced Topics in Algebra I, II. (3:3:0 each) |
| 4321. Elementary Modern Algebra. (3:3:0) | 5351. Advanced Topics in Geometry. (3:3:0) |
| 4324. Matrix Theory. (3:3:0) | 5361, 5362. Advanced Topics in Topology I, II. (3:3:0 each) |
| 4391. Vector Analysis. (3:3:0) | 630. Master's Report. (3) |
| 4392. Tensor Analysis. (3:3:0) | 631. Master's Thesis. (3) |
| | 831. Doctor's Dissertation. (3)
Enrollment required at least four times. |

Music

Professor Gene L. Hemmle
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

APPLIED MUSIC

- | FOR UNDERGRADUATES AND GRADUATES | Voice |
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| Piano 425, 426, 435, 436, 445, 446.
(2:0:1, 3:0:1, and 4:0:1) | 425, 426, 435, 436, 445, 446.
(2:0:1, 3:0:1, and 4:0:1) |
| | Organ 425, 426. (2:0:1) |

- Organ 435, 436, 445, 446. (3:0:1 and 4:0:1)
- Violin 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Violoncello 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Viola 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Double Bass 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Flute 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Oboe 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Clarinet 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Bassoon 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Saxophone 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Cornet or Trumpet 425, 426, 435, 436. (2:0:1 and 3:0:1)
- French Horn 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Trombone 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Baritone 425, 426, 435, 436. (2:0:1 and 3:0:1)
- Tuba 425, 426, 435, 436. (2:0:1 and 3:0:1)

MUSIC EDUCATION

- FOR UNDERGRADUATES AND GRADUATES
433. Piano Pedagogy. (3:3:0)
437. Voice Pedagogy. (3:3:0)
4317. Choral Conducting. (3:2:2)
4318. Instrumental Conducting (3:2:2)
- FOR GRADUATES
- 530, 531. Seminar in Music Education. (3:3:0 each)
532. Choral Music Workshop. (3:3:0)
533. Instrumental Music Workshop. (3:3:0)
534. Marching Band Direction. (3:3:0)
537. Instrumental Repertoire. (3:3:0)
5335. Music for Children. (3:3:0)
Enrollment limited to graduate students majoring in elementary education.
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.

MUSIC LITERATURE

- FOR UNDERGRADUATES AND GRADUATES
330. Voice Repertoire. (3:3:0)
332. Piano Repertoire. (3:3:0)
- 431, 432. History of Music. (3:3:0 each)
4351. Music in the General Culture. (3:3:0)
- FOR GRADUATES
531. Seminar in Music Literature. (3:3:0)
532. Choral Repertoire. (3:3:0)

THEORY

- FOR UNDERGRADUATES AND GRADUATES
- 333, 334. Form and Composition. (3:3:0 each)
427. Instrumentation. (2:2:0)
- FOR GRADUATES
531. Seminar in Music Theory. (3:3:0)

Physics

Professor H. C. Thomas
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND THE DOCTOR'S DEGREE

- FOR UNDERGRADUATES AND GRADUATES
422. Selected Topics. (2:2:0)
May be repeated for credit.
432. Thermodynamics. (3:3:0)
- 434, 435. Mechanics. (3:3:0 each)
436. Individual Study of Specified Fields. (3:3:0 or 3:0:9)
May be repeated for credit.

- 437, 438. Quantum Mechanics. (3:3:0 each)
439. Solid-State Physics. (3:3:0)
4121. Engineering Physics Seminar. (1:1:0) (Formerly E. Sem. 412)
May be repeated for credit.
- FOR GRADUATES
- 511, 512. Seminar. (1:1:0 each)
Required of all graduate majors in physics.
513. Techniques of Experimental Physics. (1:0:3)
530. Advanced Topics. (3:3:0)
May be repeated for credit.
535. Introduction to Statistical Physics. (3:3:0)
536. Advanced Dynamics. (3:3:0)
- 541, 542. Theoretical Physics. (4:4:0 each)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.
- 633, 634. Advanced Quantum Mechanics. (3:3:0 each)
- 635, 636. Electromagnetic Theory. (3:3:0 each)
- 637, 638. Structure of Matter. (3:3:0 each)
639. Advanced Statistical Physics. (3:3:0)
- 733, 734. Advanced Solid State Physics. (3:3:0 each)
- 735, 736. Atomic and Molecular Spectra. (3:3:0 each)
- 737, 738. Advanced Topics in Theoretical Physics. (3:3:0 each)
739. Individual Study. (3:1:4)
- 7311, 7312. Advanced Nuclear Physics. (3:3:0 each)
831. Doctoral Dissertation.
Enrollment required at least four times.

Psychology

Professor Theodore Andreychuk
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND THE DOCTOR'S DEGREE

Prior to enrollment in a graduate program in psychology, students should consult the Head of the Department for advice.

Master's Degree Programs

Applicants for the Master's degree may pursue one of three courses of study: (1) General Experimental Psychology, (2) Counseling Psychology, or (3) Clinical Psychology.

The program in Clinical Psychology includes a 6-semester-hour clerkship in addition to basic courses in Experimental and Counseling Psychology.

In the area of Counseling Psychology the student has a choice of two programs: (a) General Counseling and (b) Rehabilitation Counseling. The latter program is offered in cooperation with the Office of Vocational Rehabilitation of the United States Department of Health, Education, and Welfare. Traineeships are available for qualified students.

The Master's degree program in counseling requires a one-semester internship in an approved facility.

Conducted jointly with the Department of Education is a program leading to certification as a counselor in the public schools. Students interested in this program are invited to write to the head of either department.

Doctor's Degree Programs

At the doctoral level, two programs are offered: (1) Experimental Psychology and (2) Counseling Psychology. The former provides an opportunity for a student to have a major emphasis on (a) General Experimental Psychology, (b) Learning, or (c) Physiological and Comparative Psychology. The program in Counseling Psychology provides for major emphasis on (a) General Counseling or (b) Rehabilitation Counseling.

Doctoral students with major emphasis on counseling will be expected to complete a year of internship in an approved facility. By a slight change of emphasis in programming, students in the counseling program can be fully qualified to take an internship in a clinical setting if they so desire.

- FOR UNDERGRADUATES AND GRADUATES
432. Personnel Testing. (3:2:3)
Fee \$2.
434. Introduction to Social Psychology. (3:3:0)
435. Abnormal Psychology. (3:3:0)
436. Personality Development. (3:3:0)
437. Experimental Psychology. (3:2:3)
439. Industrial Psychology. (3:3:0)
4314. The Human Element in Engineering. (3:3:0)
4316. History of Psychology. (3:3:0)
4317. The Psychology of Learning. (3:3:0)
4319. Human Learning. (3:3:0)
4321. Interviewing Principles and Practice. (3:3:0)
4326. Individual Problems Course. (3)
4327. Physiological Psychology. (3:3:0)
5326. Medical Aspects of Rehabilitation. (3:3:0)
5327. The Psychology of Disability. (3:3:0)
5334. Advanced Counseling Psychology. (3:3:0)
5336. Advanced Child Psychology. (3:3:0)
5337. Play Therapy. (3:3:0)
5341. Experimental Design and Quantitative Methods in Psychology. (3:3:0)
5342. Advanced Statistical Methods. (3:3:0)
5345. Research Seminar in Clinical and Counseling Psychology. (3:3:0)
5351. Advanced Experimental Psychology and Psychodynamics. (3:3:0)
5352. Seminar in Learning Theory. (3:3:0)
5353. Seminar in Physiological Psychology. (3:3:0)
5354. Seminar in Perception. (3:3:0)
5355. Seminar in Comparative Psychology. (3:3:0)
5356. Motivation. (3:3:0)
5358. Electrophysiological Techniques. (3:3:0)
5359. Advanced General Psychology. (3:3:0)
5361. Advanced Practicum in Counseling and Clinical Psychology (3:1:0)
- 5362, 5363. Internship in Counseling and Clinical Psychology. (3:3:0 each)
561. Proseminar I. (6:6:0)
562. Proseminar II. (6:6:0)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.
- 731, 732. Research. (3 each)
831. Doctoral Dissertation. (3)
Enrollment required at least four times.
- FOR GRADUATES
532. Problems in Psychology. (3)
534. Practicum in Psychological Testing. (3)
539. Occupational Information (3:3:0)
5311. Projective Techniques I. (3:3:0)
5312. Projective Technique II. (3:3:0)
5313. Advanced Projective Techniques. (3:3:0)
5314. Tests and Measurements. (3:3:0)
5316. Introduction to Adjustment Counseling and Psychotherapy. (3:3:0)
5317. Techniques of Counseling: Career Guidance. (3:3:0)
5318. Practicum in Techniques of Counseling. (3:2:3)
5323. Group Counseling and Psychotherapy. (3:3:0)
5324. Seminar in Personality Theory. (3:3:0)
5325. Case Studies in Vocational Rehabilitation. (3:3:0)

Sociology and Anthropology

Professor W. G. Steglich

Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND MINORS ONLY FOR THE DOCTOR'S DEGREE**SOCIOLOGY**

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|---|---|
| FOR UNDERGRADUATES AND GRADUATES | 4315. The Sociology of Religion. (3:3:0) |
| 432. Introduction to Health and Welfare Services. (3:3:0) | 4316. Development of Sociological Theory. (3:3:0) |
| 433. Criminology. (3:3:0) | |
| 435. Collective Behavior and Social Movements. (3:3:0) | FOR GRADUATES |
| 436. Contemporary Sociological Theories. (3:3:0) | 531. Sociological Theory. (3:3:0)
May be repeated once for credit. |
| 437. Social Change. (3:3:0) | 533. Seminar in Contemporary Sociological Theory. (3:3:0) |
| 438. Population Problems. (3:3:0) | 534. Seminar in Sociological Research Methods. (3:3:0) |
| 439. Methods of Sociological Research. (3:3:0) | 535. Seminar in Social Disorganization. (3:3:0) |
| 4311. The Sociology of the Person. (3:3:0) | 536. Seminar in the Sociological Uses of Historical Data. (3:3:0) |
| 4312. The Urban Community. (3:3:0) | 537. Seminar in Demography. (3:3:0) |
| 4313. American Minority Problems. (3:3:0) | 631. Master's Thesis. (3) |
| 4314. Social Stratification. (3:3:0) | Enrollment required at least twice. |

ANTHROPOLOGY**MINORS ONLY FOR THE MASTER'S DEGREE**

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| FOR UNDERGRADUATES AND GRADUATES | 4111. Anthropological Linguistics. (3:3:0) |
| 430. Cultures and Peoples of the Southwest. (3:3:0) | 4312. The Plains Indians. (3:3:0) |
| 431. Field Archaeology. (3:3:0) | 4313. Races, People, and Languages of North America. (3:3:0) |
| 432. Primitive Religions. (3:3:0) | 4314. Pre-Spanish Cultures of Mexico. (3:3:0) |
| 433, 434. Southwestern Archaeology. (3 each) | |
| 436, 437. Archaeology of Mexico. (3 each) | FOR GRADUATES |
| 438. Culture and Personality. (3:3:0) | 531. Seminar in Anthropology. (3:3:0) |
| 439. Peoples and Cultures of Oceania. (3:3:0) | 5335. Origins of Social Customs and Institutions. (3:3:0) |

Speech

Professor P. Merville Larson

Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

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|--|---|
| FOR UNDERGRADUATES AND GRADUATES | 439. Methods in Teaching Speech. (3:3:0) |
| 430. Advanced Public Speaking. (3:3:0) | 4311. Stage Directing Methods. (3:2:3) |
| 431. Creative Dramatics. (3:3:0) | 4318. Functional Speech Disorders. (3:3:0) |
| 433. Introduction to Hearing Problems. (3:3:0) | 4319. Organic Speech Disorders. (3:3:0) |
| 434. Principles of Audiometry. (3:3:0) | 4321-4322. Supervised Clinical Practice in Speech Correction. (3 each) |
| 435. Interpretative Reading. (3:3:0) | 4323-4324. Supervised Clinical Practice in Audiology and Aural Rehabilitation. (3 each) |
| 436. Radio and Television Program Planning and Management. (3:2:3) | |
| 437. Persuasion. (3:3:0) | |

4325. Directing School Speech Activities. (3:2:3)
 4351. History of Speech. (3:3:0)
 4352. History of the Theater. (3:3:0)
- FOR GRADUATES
531. Studies and Problems in Speech. (3:3:0)
 535. Pathology of the Hard-of-Hearing. (3:3:0)
 536. Speech Pathology. (3:3:0)
 538. Educational Television. (3:3:0)
 5311. Advanced Organic Speech Disorders. (3:3:2)
5312. Stuttering—Theories and Therapies. (3:3:2)
 5314. Advanced Audiology. (3:3:2)
 5315. Advanced Discussion, Debate and Conference Methods. (3:3:0)
 5316. Dramatic Criticism. (3:3:0)
 5317. Studies in Modern Theater. (3:3:0)
 5319. Scene Design. (3:3:0)
 5321. Theater Costume Design. (3:3:0)
 5335. Basic Speech for Elementary Teachers. (3:3:0)
630. Master's Report. (3)
 631. Master's Thesis. (3)
 Enrollment required at least twice.

School of Business Administration

Accounting

Professor Reginald Rushing
 Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

FOR UNDERGRADUATES AND GRADUATES

430. Income Tax Accounting. (3:3:0)
 431. Advanced Income Tax Accounting. (3:3:0)
 432. Governmental Accounting. (3:3:0)
 433. Petroleum Accounting. (3:3:0)
 434. Advanced Accounting I. (3:3:0)
 435. Advanced Accounting II. (3:3:0)
 436. Accounting Systems. (3:3:0)
 437. Principles of Auditing. (3:3:0)
 438. Advanced Auditing. (3:3:0)
 439. Budgeting. (3:3:0)
 4313. Advanced Cost Accounting. (3:3:0)
 443. An Introduction to Data Processing, Computers, Programming Techniques. (4:3:3)
 444. Large Scale Tape Controlled Computers and Programming Techniques. (4:3:3)

FOR GRADUATES

531. Controllership (3:3:0)
 532. Internship. (3:3:0)
 533. Current Accounting Theory. (3:3:0)
 534. Seminar. (3:3:0)
 535. Seminar in Accounting. (3:3:0)
 536. CPA Review I. (3:3:0)
 537. CPA Review II. (3:3:0)
 538. Advanced Corporation Accounting. (3:3:0)
 539. Seminar in Federal Taxes. (3:3:0)
 5311. Advanced Accounting Problems I. (3:3:0)
 5312. Advanced Accounting Problems II. (3:3:0)
 630. Master's Report. (3)
 631. Master's Thesis. (3)
 Enrollment required at least twice.

Business Administration

630. Master's Report. (3)

631. Master's Thesis. (3)
 Enrollment required at least twice.

Business Education and Secretarial Administration

Professor W. R. Pasewark
 Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

FOR UNDERGRADUATES AND GRADUATES

432. Methods of Teaching Business Subjects. I. (3:3:0)

433. Methods of Teaching Business Subjects II. (3:3:0)

FOR GRADUATES

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| 530. Foundations of Business Education. (3:3:0)
535. Seminar in Business Education. (3:3:0)
May be repeated for credit.
536. Research and Improvement of Instruction in Bookkeeping. (3:3:0)
537. Research and Improvement of Instruction in Office Procedures. (3:3:0) | 538. Research and Improvement of Instruction in Shorthand. (3:3:0)
539. Research and Improvement of Instruction in Typewriting. (3:3:0)
5331. Problems in Business Education. (3:3:0)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice. |
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Economics

Professor R. L. Rouse
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND MINORS ONLY FOR THE DOCTOR'S DEGREE

FOR UNDERGRADUATES AND GRADUATES

430. Development of Economic Doctrines. (3:3:0)
 431. Contemporary Economic Doctrines. (3:3:0)
 432. Foreign Market Surveys. (3:3:0)
 433. International Economic Relations. (3:3:0)
 435. Transportation Economics. (3:3:0)
 437. Current Economic Problems. (3:3:0)
 4311. Advanced Economic Theory. (3:3:0)
 4312. Theories of Depressions. (3:3:0)

FOR GRADUATES

531. Economic Research. (3:3:0)
 532. Advanced Micro-Economic Analysis. (3:3:0)
 533. Advanced Macro-Economic Analysis. (3:3:0)
 534. Seminar in Contemporary Economic Problems. (3:3:0)
 535. Seminar in Economic Policy. (3:3:0)
 5335. Human Geography. (3:3:0)
 630. Master's Report. (3)
 631. Master's Thesis. (3)
 Enrollment required at least twice.

Finance

Professor R. L. Rouse
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

FOR UNDERGRADUATES AND GRADUATES

431. The Federal Reserve System. (3:3:0)
 432. Real Estate. (3:3:0)
 433. Corporate Financial Problems and Cases. (3:3:0)
 434. Investments. (3:3:0)
 435. Property Insurance. (3:3:0)
 437. Casualty Insurance. (3:3:0)
 438. Bank Administration. (3:3:0)
 439. Real Estate Appraisal. (3:3:0)

FOR GRADUATES

531. Current Financial Problems. (3:3:0)
 532. Seminar in Business Financial Policy. (3:3:0)
 533. Seminar in Investment Analysis. (3:3:0)
 534. Seminar. (3:3:0)
 535. Seminar in Current Banking Problems. (3:3:0)
 630. Master's Report. (3)
 631. Master's Thesis. (3)
 Enrollment required at least twice.

BUSINESS LAW

FOR UNDERGRADUATES AND GRADUATES

4311. CPA Law Review. (3:3:0)

Management

Professor F. L. Mize
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
431. Wage Administration. (3:3:0)	511. Individual Problems. (1:1:0)
432. Administrative Policies. (3:3:0)	524. Seminar in Management. (2:2:0)
433. Recent Labor Legislation (3:3:0)	531. Current Problems in Management. (3:3:0)
434. Advanced Personnel Management. (3:3:0)	532. Research in Management. (3:3:0)
435. Employee Supervision. (3:3:0)	534. Seminar in Management. (3:3:0)
436. Systems and Procedures. (3:3:0)	630. Master's Report. (3)
442. Industrial Management. (3:3:2)	631. Master's Thesis. (3) Enrollment required at least twice.

Marketing

Professor J. A. Ryan
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
426. Index Numbers. (2:2:0)	4316. Advertising Administration. (3:3:0)
431. Industrial Marketing. (3:3:0)	4319. Internship. (3:1:5)
433. Marketing Problems. (3:3:0)	
434. Wholesaling. (3:3:0)	FOR GRADUATES
435. Business Cycles and Forecasts. (3:3:0)	531. Advanced Marketing Problems. (3:3:0)
436. Marketing Research and Analysis. (3:3:0)	532. Advanced Marketing Research. (3:3:0)
437. Advanced Business Statistics. (3:3:0)	533. Marketing Thought and Theory. (3:3:0)
438. Sales Promotion, Retail Advertising, and Display. (3:3:0)	534. Seminar in Marketing. (3:3:0)
439. Sales Management. (3:3:0)	535. Statistical Decision Making. (3:3:0)
4311. Advertising Practices. (3:3:0)	536. Individual Study in Marketing I. (3:3:0)
4312. Advanced Advertising Practices. (3:1:4)	537. Individual Study in Marketing II. (3:3:0)
4315. Retail Buying. (3:3:0)	631. Master's Thesis. (3) Enrollment required at least twice.

School of Engineering

The graduate courses offered by the School of Engineering are specifically designed for a twofold purpose: to offer to the student interested in the conventional degree of Master of Science in the fields of Chemical, Civil, Electrical, Industrial, or Mechanical Engineering a balanced program with a high degree of specialization in selected areas and to offer, also, an interdisciplinary complex of course and research work leading to the Degree of Doctor of Philosophy. In the latter, a flexible variety of options is available permitting either a measure of specialization in one of the above named engineering fields or the breadth to be achieved through three interdisciplinary fields chosen from such areas as systems engineering, nuclear engineering, aerospace, electronics, transport phenomena, engineering mechanics, thermal science, materials science, operations

research, mathematics, and biomedical and bioengineering studies, combined with some depth in the subject area of the dissertation.

Architecture and Allied Arts

Professor N. E. Barrick
Head of the Department

MINORS ONLY FOR THE MASTER'S DEGREE

ARCHITECTURE

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|--|---|
| FOR UNDERGRADUATES AND GRADUATES | 430. History of Early American Architecture. (3:3:0) |
| 320. History of Furniture and Costume. (2:2:0) | 432. History of Renaissance Architecture (3:3:0) |
| 323. History of Modern Architecture. (2:2:0) | 4316-4317. Architectural Sculpture. (3:1:6 each) |
| 420. Professional Practice. (2:2:0) | 435. Advanced Architectural Working Drawings. (3:0:9) |
| 423. Life Drawing II. (2:0:6)
May be repeated for credit. | 436. City Planning. (3:1:6) |

ALLIED ARTS

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| FOR UNDERGRADUATES AND GRADUATES | 4318-4319. History of Painting and Sculpture. (3:3:0 each) |
| 421. Art Workshop. (2:0:6)
May be repeated for credit. | 4351. Art in Elementary Education. (3:1:6) |
| 433-434. Commercial Design II. (3:0:9 each) | FOR GRADUATES |
| 4311-4312. Ceramics. (3:0:9 each) | 5335. Art in the Modern World. (3:3:0) |

Chemical Engineering

Professor Arnold J. Gully
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

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|--|---|
| FOR UNDERGRADUATES AND GRADUATES | 4352. Process Design. (3:3:0) |
| 4241-4242. Unit Operations Laboratory. (2:0:6 each) | 4353. Instrumentation. (3:2:3) |
| 4121. Chemical Engineering Seminar. (1:1:0) | 4354. Chemical Engineering Plant Design. (3:1:6) |
| 4311-4312. Chemical Engineering III-IV. (3:3:0 each) | 4371. Nuclear Engineering. (3:3:0) |
| 4321-4322. Chemical Engineering Thermodynamics. (3:3:0 each) | FOR GRADUATES |
| 4323. Chemical Reaction Engineering. (3:3:0) | 5311. Transport Phenomena—Heat Transmission. (3:3:0) |
| 4331. Special Problems in Chemical Engineering. (3:3:0) | 5312. Transport Phenomena—Fluid Dynamics. (3:3:0) |
| 4332. Special Experimental Problems in Chemical Engineering. (3:0:9) | 5313. Transport Phenomena—Diffusion Processes. (3:3:0) |
| 4341. Unit Processes. (3:3:0) | 5314. Process Dynamics and Automatic Control. (3:3:0) |
| 4343. Engineering Experimentation. (3:3:0) | 5321. Advanced Chemical Engineering Thermodynamics. (3:3:0) |
| | 5322. Equilibrium Systems. (3:3:0) |

5331. Special Problems in Chemical Engineering. (3:3:0)
May be repeated for credit.
5332. Experimental Studies in Chemical Engineering. (3:0:9)
May be repeated for credit.
5341. Distillation. (3:3:0)
5343. Reaction Kinetics. (3:3:0)
5348. Organic Syntheses. (3:3:0)
5351. Chemical Engineering Design. (3:1:6)
- 5371-5372. Principles of Nuclear Engineering. (3:3:0 each)
- 5373-5374. Nuclear Chemical Engineering. (3:3:0 each)
5378. Reactor Shielding. (3:3:0)
5379. Nuclear Reactor Instrumentation and Control. (3:3:0)
- 5381-5382. Nuclear Radiations Laboratory. (3:2:6 each)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.
731. Research. (3)
732. Research. (3)
831. Doctor's Dissertation. (3)
Enrollment required at least four times.

Civil Engineering

Professor K. R. Marmion
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE AND THE DOCTOR'S DEGREE

- FOR UNDERGRADUATES AND GRADUATES
4261. Transportation and Traffic Engineering. (2:1:3)
4321. Soil Engineering. (3:3:0)
4337. Cost Estimating. (3:3:0)
4339. Law and Ethics in Engineering. (3:3:0)
4342. Structural Design, II. (3:2:3)
4344. Reinforced Concrete Structures II. (3:3:0)
4351. Intermediate Hydromechanics. (3:3:0)
4353. Elements of Hydraulic Engineering. (3:3:0)
4355. Ground Water Hydrology. (3:3:0)
4362. Highway Engineering II. (3:3:0)
5313. Theory of Elastic Stability. (3:3:0)
5314. Theory of Plates and Shells. (3:3:0)
5316. Theory of Elasticity. (3:3:0)
5321. Advanced Soil Engineering. (3:3:0)
- 5331, 5332. Advanced Work in Specific Fields. (1 to 6)
5342. Advanced Plastic Design. (3:3:0)
5343. Advanced Structural Analysis. (3:3:0)
5344. Advanced Reinforced Concrete Design. (3:3:0)
5346. Design of Structures for Dynamic Loads. (3:3:0)
5351. Open Channel Hydraulics. (3:3:0)
5353. Water Resources Engineering. (3:3:0)
5355. Flow in Porous Media. (3:3:0)
5356. Earth Dams. (3:3:0)
5371. Advanced Water and Waste Treatment. (3:2:3)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.
831. Doctor's Dissertation. (3)
Enrollment required at least four times.
- FOR GRADUATES
5121. Advanced Soil Engineering Laboratory. (1:0:3)
5237. Construction Management. (2:2:0)
5311. Advanced Mechanics of Solids. (3:3:0)

Electrical Engineering

Professor H. A. Spuhler
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

- FOR UNDERGRADUATES AND GRADUATES
4311. Analog and Digital Computation. (3:3:0)
4317. Electronics III. (3:3:0)
4318. Physical Electronics. (3:3:0)
4321. Passive Network Synthesis. (3:3:0)
4322. Topological Network Analysis. (3:3:0)
4333. Experimental Laboratory II. (3:0:9)
4343. Energy Transmission. (3:3:0)
4351. Energy Conversion I. (3:3:0)
4352. Energy Conversion II. (3:3:0)
4353. Feedback Control Systems. (3:3:0)
4354. Acoustics. (3:3:0)
4355. Nonlinear Feedback Systems. (3:3:0)
4361. Introduction to Information Theory and Noise. (3:3:0)
- FOR GRADUATES
5311. Stability of Nonlinear Systems. (3:3:0)
5312. Optimal and Adaptive Control Systems. (3:3:0)
- 5313-5314. Solid-State Electronics I and II. (3:3:0 each)
5315. Sampled Data and Digital Control Systems. (3:3:0)
5317. Advanced Transients. (3:3:0)
5318. Pulse and Timing Circuits. (3:3:0)
5319. Electronic Circuits and Systems. (3:3:0)
5321. Digital Systems. (3:3:0)
- 5322-5323. Advanced Network Theory I and II. (3:3:0 each)
5325. Information Theory. (3:3:0)
5326. Network Applications of Linear Graph Theory. (3:3:0)
5327. Multistage Decision Processes. (3:3:0)
5328. Statistical Theory of Communications. (3:3:0)
5331. Theoretical Investigations in Engineering Applications. (3:3:0)
5332. Experimental Investigations in Engineering Applications. (3:0:9)
- 5341-5342. Advanced Electromagnetic Theory I and II. (3:3:0 each)
5343. Radio Propagation. (3:3:0)
5344. Antennas and Radiating Systems. (3:3:0)
630. Master's Report. (3)
631. Master's Thesis. (3)
- Enrollment required at least twice.
- 731, 732. Research. (3 each)
831. Doctor's Dissertation. (3)
- Enrollment required at least four times.

Industrial Engineering

Professor R. A. Dudek
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

- FOR UNDERGRADUATES AND GRADUATES
417. Industrial Statistics Problem Laboratory. (1:0:3)
421. Materials Handling. (2:2:0)
439. Analysis of Industrial Operations. (3:3:0)
4121. Industrial Engineering Seminar. (1:1:0)
4221. Special Problems in Industrial Engineering. (2:2:0)
4311. Automatic Data Processing Systems. (3:3:0)
4331. Individual Studies in Industrial Engineering. (3:3:0)
- May be repeated for credit.
4332. Special Experimental Problems in Industrial Engineering. (3:0:9)
- May be repeated for credit.
4334. Work Analysis and Design III. (3:2:3)
4341. Work Control II. (3:3:0)
4351. Production Design II. (3:2:3)
4361. Industrial Engineering Design. (3:3:0)

FOR GRADUATES

512. Industrial Engineering Graduate Seminar. (1:1:0)
532. Standard Data Systems. (3:2:3)
535. Engineering Controls for Industrial Safety. (3:3:0)
536. Dynamics of Engineering Economy. (3:3:0)
538. Engineering Aspects of Wage Policies. (3:3:0)
- 5111, 5212, 5213, 5214. Industrial Engineering Case Analysis. (1:2 each)
5301. Advanced Work Analysis and Design I. (3:2:3)
5302. Advanced Work Analysis and Design II. (3:2:3)
5303. Advanced Work Analysis and Design III. (3:2:3)
- 5307, 5308. Advanced Production Control. (3:3:0 each)
- 5311, 5312. Analysis Techniques for Management. (3:3:0 each)
- 5314, 5315. Analysis Techniques for Work Systems. (3:3:0 each)
5316. Statistical Reliability Analysis. (3:3:0)
5317. Advanced Industrial Statistics. (3:3:0)
5318. Selected Topics in Advanced Statistics. (3:3:0)
May be repeated for credit.
- 5321, 5322. Decision Theory and Management Science. (3:2:3 each)
- 5351, 5352. Advanced Production Design. (3:2:3 each)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.
- 731, 732. Research. (3 each)
831. Doctor's Dissertation. (3)
Enrollment required at least four times.

Mechanical Engineering

Professor L. J. Powers
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE
AND THE DOCTOR'S DEGREE

FOR UNDERGRADUATES AND GRADUATES

421. Mechanical Engineering Seminar. (1)
May be repeated for credit.
431. Engineering Reports. (1:1:0)
(Formerly 410)
May be repeated for credit.
- 4212, 4213. Thermodynamics. (2:2:0 each)
- 4216, 4217. Design, I, II. (2:1:3 each)
(Formerly 320, 321)
- 4312, 4313. Mechanical Engineering Laboratory, I, II. (3:1:6 each)
(Formerly 430, 431)
4314. Fluid Dynamics. (3:3:0)
(Formerly 435)
4315. Heat and Mass Transfer. (3:3:0)
4316. Dynamics. (3:3:0)
(Formerly 3313)
4331. Special Problems in Mechanical Engineering. (3)
May be repeated for credit.
5313. Dynamics III. (3:3:0)
5314. Stress Analysis I. (3:2:3)
(Formerly 5311)
5321. Thermodynamics I. (3:3:0)
(Formerly 531)
5322. Thermodynamics II. (3:3:0)
5324. Heat Transmission I. (3:3:0)
(Formerly 532)
5325. Heat Transmission II. (3:3:0)
(Formerly 533)
5326. Heat Transmission III. (3:3:0)
5327. Aerodynamics I. (3:3:0)
(Formerly 534)
5328. Aerodynamics II. (3:3:0)
(Formerly 535)
5329. Aerodynamics III. (3:3:0)
5331. Theoretical Studies in Advanced Topics. (3:3:0)
May be repeated for credit.
5332. Experimental Studies in Advanced Topics. (3:1:6)
May be repeated for credit.
5333. Design I. (3:2:3)
5341. Metallurgy I. (3:3:0)
(Formerly 539)
630. Master's Report. (3)

FOR GRADUATES

5312. Dynamics II. (3:3:0)
(Formerly Mechanical Vibrations)

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| <p>631. Master's Thesis. (3)
Enrollment required at least twice.</p> <p>731, 732. Research. (3 each)
May be repeated for credit.</p> | <p>831. Doctoral Dissertation. (3)
Enrollment required at least four times.</p> |
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Petroleum Engineering

Professor W. L. Ducker
Head of the Department

MINORS ONLY FOR THE MASTER'S DEGREE

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>413. Natural Gas Laboratory. (1:0:3)</p> <p>416. Reservoir Engineering Laboratory.
(1:0:3)</p> <p>420. Petroleum Property Evaluation and
Management. (2:1:3)</p> <p>430. Special Natural Gas and Production
Problems. (3:3:0)</p> | <p>433. Reservoir Engineering. (3:3:0)</p> <p>434. Natural Gas Engineering. (3:3:0)</p> <p>435. Advanced Natural Gas Engineering.
(3:3:0)</p> <p>436. Advanced Reservoir Engineering.
(3:3:0)</p> |
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School of Home Economics

Applied Arts

Professor B. C. Lockhart
Head of the Department

MINORS ONLY FOR THE MASTER'S DEGREE

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>411. Special Problems. (1:0:2)
May be repeated for credit.</p> <p>431. Silk Screen. (3:1:4)</p> <p>432. Sculpture. (3:1:4)</p> <p>433. Advanced Interior Design. (3:1:4)</p> <p>434. Metalwork. (3:1:4)</p> <p>435. Jewelry. (3:1:4)</p> <p>436. Art in Secondary Education.
(3:2:2)</p> <p>439. Experience Training in Applied
Arts. (3:1:6)
May be repeated for credit.</p> | <p>FOR GRADUATES</p> <p>511. Advanced Applied Arts Unit.
(1:0:2)
May be repeated for credit.</p> <p>531. Special Problems. (3:1:4)
May be repeated for credit.</p> <p>537. Art for Exceptional Children.
(3:1:4)</p> <p>538. Vocational Arts Orientation and
Evaluation in Rehabilitation Coun-
seling. (3:1:4)</p> <p>5335. Theory and Practice of Art for
Elementary Teachers. (3:1:4)</p> |
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Clothing and Textiles

Professor Martha Gene Shelden
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

(All degree programs are to be cleared through the Committee on Graduate Studies in the School of Home Economics.)

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| <p>FOR UNDERGRADUATES AND GRADUATES</p> <p>411. Special Problems. (1:0:3)
May be repeated for 2 or 3 hours'
credit.</p> | <p>431. Textile Testing and Analysis.
(3:1:4)</p> <p>432. Dress Design through Draping:
(3:1:4)</p> |
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433. History and Philosophy of Dress. (3:3:0)
436. Flat Pattern Design. (3:1:4)
437. Demonstration Techniques in Clothing. (3:3:0)
438. Historic Textiles. (3:3:0)
- FOR GRADUATES
511. Advanced Clothing Problems. (1:0:3)
May be repeated for credit.
518. Seminar. (1:1:0)
531. Special Problems in Clothing and Textiles. (3:1:4)
May be repeated for credit.
534. Custom Tailoring. (3:1:4)
535. Advanced Problems in Upholstery, Draperies, and Other Household Fabrics. (3:1:4)
5335. Textiles for Elementary Teachers. (3:3:0)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.

Food and Nutrition

Professor Mina W. Lamb
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

(All degree programs are to be cleared through the Committee on Graduate Studies in the School of Home Economics.)

FOR UNDERGRADUATES AND GRADUATES

411. Problems in Food and Nutrition. (1:1:0)
May be repeated for credit but only 1 hour may be applied toward any degree.
421. Advanced Food Production Management. (2:1:3)
422. Food Technology. (2:1:2)
425. Food Demonstrations. (2:1:2)
431. Nutrition in Disease. (3:2:3)
432. Advanced Human Nutrition. (3:3:0)
436. Experimental Methods with Food. (3:1:6)
439. Food Economics. (3:1:4)

FOR GRADUATES

515. Special Aspects of Food and Nutrition. (1:0:3)
531. Research in Food and Nutrition. (3:1:6)
May be repeated once for credit.
533. Seminar in Food and Nutrition. (3:3:0)
May be repeated once for credit.
534. Advanced Problems in Human Nutrition and Foods. (3:3:0)
May be repeated for credit.
5335. Principles and Applications of Nutrition for Elementary Teachers. (3:3:0)
630. Master's Report. (3)
631. Master's Thesis. (3)
Enrollment required at least twice.

Home and Family Life

Associate Professor Estelle H. Wallace
Acting Head of the Department

MINORS ONLY FOR THE MASTER'S DEGREE

CHILD DEVELOPMENT AND FAMILY RELATIONS

FOR UNDERGRADUATES AND GRADUATES

433. Family Relations. (3:3:0)
435. Student Teaching in Preschool. (3)
436. Community and Professional Responsibilities to Children and Families. (3:2:2)
438. Exceptional Children in the Family. (3:2:3)

439. Family Life in the Middle and Later Years. (3:3:0)

FOR GRADUATES

534. Special Topics in Child Development. (3:3:0)
5336. Advanced Interpersonal and Family Relations. (3:3:0)

HOME MANAGEMENT

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
431. Advanced Housing for the Family. (3:1:4)	511. Studies in Home Management. (1:1:0)
432. Home Management Residence. (3)	531. Advanced Home Management. (3:3:0)
433. Advanced Household Equipment. (3:1:4)	
435. Advanced Consumer Problems. (3:3:0)	

Home Economics Education

Professor L. Ann Buntin
Head of the Department

MAJORS AND MINORS FOR THE MASTER'S DEGREE

(All degree programs are to be cleared through the Committee on Graduate Studies in the School of Home Economics.)

FOR UNDERGRADUATES AND GRADUATES	FOR GRADUATES
426. Problems in Student Teaching. (2:0:4)	531. Administration and Supervision of Home Economics Education. (3:3:0)
432. Methods of Teaching Home Economics. (3:3:0)	532. Curriculum Development in Home Economics. (3:3:0)
434. Current Issues and Developments in Home Economics Education. (3:3:0)	533. Evaluation in Home Economics. (3:3:0)
436. Home, School and Community Experiences in Home Economics Education. (3:3:0)	534. Techniques of Research in Home Economics. (3:3:0)
461. Student Teaching in Home Economics. (6:0:18)	536. Problems. (3:3:0) May be repeated for credit.
	537. Techniques of Supervision in Home Economics. (3:3:0)
	630. Master's Report. (3)
	631. Master's Thesis. (3) Enrollment required at least twice.
FOR GRADUATES	
514. Specific Problems in Teaching Home Economics. (1:1:0) May be repeated for credit.	

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