From the Dean

To students:

Many recent evaluations of educational activities in the United States have been directed at primary and secondary programs, as well as the need for better teaching in baccalaureate programs. Relatively little is said about post baccalaureate activities. The thrust of these comments has been to remind us that it is really on the post baccalaureate programs that the future success of all the other programs depend. Regardless of the level of sophistication of the educational enterprise, if graduate programs fail to produce highly qualified and highly motivated individuals, many of the teaching, research, and administrative activities of the future will fail.

Although all of the functions undertaken by the recipients of the Master’s and Doctor of Philosophy degrees are extremely important, contribution of original ideas to the pool of knowledge may be most important. Indeed, the hallmark of graduate education should be the development of the intellectual resources to conduct original research and to communicate the results of this activity to one’s colleagues. In a very real sense the conduct of original research is a service to our local communities as well as to the broader, world-wide community because these efforts increase our understanding of ourselves and the world around us. Through these efforts of discovery, the scholar-teacher enhances our well being.

The graduate programs available to you at the University of Nebraska Medical Center are diverse. They will encompass very basic laboratory science as well as important research-oriented patient care opportunities. Despite this diversity, all of the programs will:

1. Allow the student to acquire the basic background knowledge on which to build, and
2. Afford the student the opportunity to develop original ideas in his/her chosen area of study.

These activities will involve more than traditional classroom exercises. In general, the programs are flexible. The flexibility and diversity of graduate activities obviate the traditional lock-step style of curriculum experienced in most undergraduate and professional programs. Indeed the graduate student must be involved in the development of his or her own curriculum. The challenge of new discovery, communication of ideas, and service to society is before us. Best of luck in your pursuits.

Rubens J. Pamies, M.D.
Dean for Graduate Studies
Calendar: Academic Year 2006-2007
Academic calendars are subject to change without notice.

Fall Semester 2006
Classes begin Monday, August 21
Vacation, Monday, September 4
Fall Break, Monday and Tuesday, October 16 and 17
Vacation, Thursday, November 23 through Sunday, November 26
Classes end Friday, December 8
Exam week follows.

Spring Semester 2007
Classes begin Monday, January 8
Martin Luther King Day, Monday, January 15
Vacation, Saturday, March 10 through Sunday, March 18
Classes end Friday, April 27
Exam week follows.

Summer 2007
Eight Week Session — Monday, May 14 through Friday, July 6
First Five Week Session — Monday, June 4 through Friday, July 6
Second Five Week Session — Monday, July 9 through Friday, August 10
Governance

Board of Regents
Bob Phares, North Platte
Randy Ferlic, M.D., Omaha
Chuck Hassebrook, Walthill
Howard L. Hawks, Omaha
Jim McClurg, Ph.D., Lincoln
Drew Miller, Papillion
Kent Schroeder, J.D., Kearney
Charles S. Wilson, M.D., Lincoln
Mike Elberger, Student Regent, UNK
Matt Schaefer, Student Regent, UNL
Dan Conneally, Student Regent, UNMC
Steve Massara, Student Regent, UNO

University of Nebraska Central Administration
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Linda Pratt, Ph.D., Interim Executive Vice President for Academic Affairs and Provost, Dean of the Graduate College
David E. Lechner, Vice President for Business and Finance
Richard R. Wood, J.D., Vice President and General Counsel
Pete Kotsiopulos, Vice President for University Affairs
Donal Burns, Ph.D., Corporation Secretary
Harold M. Maurer, M.D., Vice President, and Chancellor of the University of Nebraska Medical Center
Douglas A. Kristensen, J.D., Vice President, and Chancellor of the University of Nebraska-Kearney
Harvey S. Perlman, J.D., and Chancellor of the University of Nebraska-Lincoln
John Christensen, Ph.D., Interim Chancellor of the University of Nebraska-Omaha
John C. Owens, Ph.D., Vice President and Vice Chancellor for Agriculture and Natural Resources

University of Nebraska Medical Center Administration
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Donald S. Leuenberger, M.A., Vice Chancellor for Business and Finance
Thomas H. Rosenquist, Ph.D., Vice Chancellor for Research
Bob Bartee, M.A., Vice Chancellor for External Affairs

Administrative unit
Rubens J. Pamies, M.D., Dean for Graduate Studies
Bruce A. Buehler, M.D., Director, Munroe-Meyer Institute
Kenneth H. Cowan, M.D., Ph.D., Director, Eppley Institute for Research in Cancer and Allied Diseases and Director, UNMC/Eppley Cancer Center
Kyle Meyer, P.T., M.S., M.P.A., Associate Dean, School of Allied Health Professions
Yvette A. Holly, Assistant Vice Chancellor for Information Technology Services
John W. Reinhardt, D.D.S., M.S., M.P.H., Dean, College of Dentistry
John Gollan, M.D., Ph.D., Dean, College of Medicine
Virginia P. Tilden, D.N.Sc., Dean, College of Nursing
Clarence T. Ueda, Pharm.D., Ph.D., Dean, College of Pharmacy

Academic resource units
David S. Carver, Ph.D., Director, Student Counseling Center
Sandra S. Goetzinger-Comer, Director, Office of Public Affairs
Mary J. McNamee, Ph.D., Director, Student Equity and Multicultural Affairs and Associate Director, Student Recruitment
John W. McClain, Ph.D., Associate Vice Chancellor, Student Services
Judith Walker, Executive Director, Student Administrative Services and Director, Financial Aid
Lois Colburn, Executive Director, Center for Continuing Education
Nancy N. Woelfl, Ph.D., Director, Leon S. McGoogan Library of Medicine

**Graduate College administration**

**University-wide:**
Linda Pratt, Ph.D., Interim Executive Vice President for Academic Affairs and Provost, Dean of the Graduate College
Rubens J. Pamies, M.D., Dean for Graduate Studies, University of Nebraska Medical Center
Prem S. Paul, Ph.D., Dean for Graduate Studies, University of Nebraska-Lincoln
Kenneth Nikels, Ph.D., Dean for Graduate Studies and Research, University of Nebraska- Kearney
Thomas B. Bragg, Ph.D., Dean for Graduate Studies, University of Nebraska-Omaha

**Medical Center:**
Rubens J. Pamies, M.D., Dean for Graduate Studies
David A. Crouse, Ph.D., Executive Associate Dean for Graduate Studies
Amy Schlueter, Administrator
**Graduate Studies**

The University of Nebraska is composed of four major administrative units: the University of Nebraska-Kearney (UNK), the University of Nebraska-Lincoln (UNL), the University of Nebraska Medical Center (UNMC), and the University of Nebraska-Omaha (UNO). Each of the four major units is led by a Chancellor who reports to the University President. The University is ultimately governed by a twelve-member Board of Regents who insure that the Institution fulfills its role and mission of providing quality instruction, research, and public service for the citizens of the state.

The Graduate College of the University of Nebraska is a system-wide college with programs administered on each of the four major administrative units of the University of Nebraska. The Dean of the Graduate College, in conjunction with an Executive Graduate Council representing the Graduate Faculty, is responsible for the College’s activities. Graduate educational programs are offered at UNK, UNL, UNMC and UNO through separate Graduate Studies divisions each led by a Dean for Graduate Studies. Each campus Dean reports to both the Chancellor of the campus and to the Dean of the Graduate College. Information on the graduate programs on the other campuses should be requested from the campus Graduate Studies Office.

As part of the system-wide Graduate College, the Graduate Studies programs at UNMC offer advanced instruction leading to the Master's and Doctor of Philosophy degrees in health-related areas. The UNMC Dean for Graduate Studies, in conjunction with the UNMC Graduate Council elected from the UNMC Graduate Faculty, is responsible for Graduate College activities at the Medical Center.
Admission to the Graduate College

In accordance with University Policy, UNMC prohibits the denial of admission or of Medical Center privileges to students or applicants on the basis of individual characteristics such as race, color, sex, national origin, age, disability, religious or political beliefs or sexual orientation. These privileges include but are not limited to admission, class assignments, scholarships, fellowships, assistantships, and financial aid, as well as housing and recreational facilities. Furthermore, student organizations must base their selection of students for membership on criteria which will not exclude students based upon individual characteristics such as race, color, religion, sex, national origin, age, disability or sexual orientation.

Applicants must hold the minimum of a baccalaureate degree or equivalent from a recognized college or university. Specific requirements for admission to a graduate program with full graduate standing are listed in the departmental sections. In general, admission to graduate programs requires a minimum GPA of 3.0 based on a four-point scale.

The qualification for admission to and graduation from the various programs of graduate study is dependent upon possession of the following technical standards:

1. The intellectual capacity to meet curricular requirements.
2. Physical ability to pursue administration, teaching and/or independent research.
3. The ability to communicate effectively with mentors, peers and other professionals in the academic community.
4. Sufficient emotional stability to permit management of the demands associated with the pursuit of professional activities.

These technical standards are minimum requirements for participation in graduate programs at UNMC which require significant laboratory or research-oriented activities. Individuals wishing to participate in programs with requirements for patient care or patient contact must have technical standards defined individually.

In summary, UNMC policies are in accord with Title VI of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, and Sections 799A and 854 of the Public Health Services Act.

Admission requirements. The Graduate College is open to graduates of all the colleges of this University and to graduates of other universities and colleges of recognized standing whose requirements for graduation are substantially the same as those in the corresponding college of this University. Persons who have completed the requirements for, but have not yet received, the bachelor's degree may register in the Graduate College provisionally.

Admissions by the Dean for Graduate Studies to pursue graduate work are limited to the number that can best be handled to the advantage of the college and the students. Preference is given to residents of Nebraska, to individuals who wish to pursue study that can be adequately supported by UNMC resources, and to those who have adequate preparation and time for their proposed program.

Acceptance of Senior Credits. Seniors at an accredited institution who have obtained in advance the approval of the Dean for Graduate Studies may receive up to 12 hours of credit for graduate courses taken at any campus of the University of Nebraska, in addition to the courses necessary to complete their undergraduate work. Such credits must be earned within the twelve months prior to receipt of the baccalaureate.

Seniors in this University needing not more than nine hours of undergraduate credit to complete the bachelor's degree and wishing to register for graduate credit may be granted provisional admission to the Graduate College subject to receiving their baccalaureate degrees within one calendar year. Such applicants must follow the regular admission procedures. If admitted, such registration may count as residence in the Graduate College.
Course work taken for graduate credit at this institution prior to receipt of the baccalaureate degree may not always be accepted for transfer to other institutions as graduate work. Students admitted to professional colleges at the University of Nebraska may enroll in up to a total of nine credit hours of graduate-level courses (800 and 900 series) as electives in the professional curriculum with the approval of the dean of the professional college, the instructors for the graduate courses, and the Dean for Graduate Studies. In exceptional circumstances, registrations above nine credit hours may be permitted subject to the same approval.

**Graduate Record Examination.** Applicants for admission are advised that their scores on the Graduate Record Examination constitute a desirable credential to submit in applying for admission and may be required for admission to certain programs. Arrangements to take the Graduate Record Examination may be made through the Educational Testing Service, CN6000, Princeton, New Jersey, 08541-6000. Institutional Code 6896.

**Foreign students.** Applicants from foreign countries where English is not the primary language must present official scores on the Test of English as a Foreign Language (TOEFL) and official scores on the Graduate Record Examination. A score of at least 550 on the paper-based TOEFL, 213 on the computer-based TOEFL, or 80 on the internet-based TOEFL is required. Scores on the General Test and any appropriate Advanced Test of the Graduate Record Examination must reach the Graduate Studies Office before the application can be considered. **Official score reports from the Educational Testing Service are required. Photocopies will not be accepted. Under no circumstances will we accept GRE scores that are more than three years old.** Computer-based scores from the People’s Republic of China (including Hong Kong), Korea, and Taiwan will not be accepted if taken prior to July 2003. Foreign students admitted for graduate study on the basis of undergraduate work completed in a college or university in which instruction is in a language other than English will be required to demonstrate acceptable proficiency in English before they will be eligible for admission to candidacy for a Master’s degree or for approval of their program of studies for the Ph.D. degree.

**Application for admission.** An application for admission, a $45 application fee, three letters of recommendation, a narrative describing the applicant’s career goals, a felony disclosure statement and official transcripts of all college work must be sent to the Office of Academic Records by the program deadlines. Students applying late may encounter delays in admission and may not be able to register for the desired session. Transcripts and all other materials submitted in support of an application become the permanent property of the University and will not be returned.

**Admission status.** Graduate students will be admitted to the following categories:

**Full Graduate Standing** — students who have met the minimum requirements for admission and who have been accepted by a department or interdepartmental degree program for work leading to a graduate degree.

**Provisional Status** — students who show potential for successful graduate work but have deficiencies in prerequisite course work or other admission stipulations. Students with Provisional Status cannot become candidates for a degree unless they are recommended for Full Graduate Standing by the cognizant Graduate Committee.

**Unclassified status** — students who satisfy minimum admission requirements and desire to complete a minimum of course work without a degree objective.

**Unclassified students** — students who wish to take graduate courses for professional growth, improvement of skills, or transfer of course credits to a degree program at another institution, but who do not anticipate working for an advanced degree at UNMC, may register as unclassified students subject to the following conditions:

1. The student must comply with all requirements for admission to the Graduate College.
2. Registration for each course taken as an unclassified student is subject to the approval of the course instructor and the Dean for Graduate Studies. In courses with limited enrollment, preference is given to degree-seeking students with full graduate standing.

3. Readmittance as an unclassified student for the purpose of enrolling in an additional course is required for each subsequent semester. Readmittance is contingent upon the student maintaining the same academic standards as regular graduate students.

Should such students subsequently desire to pursue an advanced degree, they may change their status from unclassified to full graduate standing by submission of a complete application to the Graduate College as a degree-seeking student and admission into an appropriate program by the Dean for Graduate Studies.

Appropriate credits earned in the unclassified status may be used to fulfill graduate degree requirements only if approved by the program Graduate Committee, the student’s Supervisory Committee, and the Dean for Graduate Studies. No more than one-third of the course work applied toward a graduate degree may be taken as an unclassified student.

**Departmental and group requirements.** Students who wish to become candidates for advanced degrees must fulfill the particular requirements of the program in which they wish to major as well as the general requirements of the Graduate College. Graduate students may be required to attain proficiency in their field of concentration by participation in the instruction of students in a regularly required course.
Scholarship requirements

A student failing to receive a minimum acceptable grade in a course for graduate credit may not continue his/her program of studies without permission of the Supervisory Committee or the program Graduate Committee concerned. The committee's decision, along with an appropriate explanation and justification, must be filed in the Graduate Studies Office.

To receive credit in didactic and seminar-type graduate level courses, it is expected that students will perform at the level of B or above in any course that is offered for graduate credit. However, a minimum grade of C may be acceptable for graduate level courses, but receipt of two grades of C may be cause for dismissal. Any grade below C is not acceptable for graduate credit.

A student who fails to maintain an overall grade point average of at least 3.0 in any given semester will automatically be on academic probation and may not continue his/her program of study without special permission of the Dean for Graduate Studies acting on the recommendation of the appropriate graduate or supervisory committee. The recommendation must include a review of the student's status and a program of remediation. To continue in the Graduate Studies program, the student must remove the probationary status (i.e., return to an overall 3.0 grade point average) within the next twelve (12) months.

Because research activities comprise a major part of the endeavors of graduate students, excellence in research is expected of all students. Therefore, a failing grade in any research activity (non-thesis research, Master's Thesis, or Doctoral Dissertation) may be grounds for dismissal.

The above minimum scholarship requirements apply to ALL students enrolled in ANY course for graduate credit. Additional requirements may exist for certain graduate programs and departments as set forth in this Bulletin, in the departmental course listings and/or in department/program descriptions which may be provided to students at the time of admission.

If a student fails to pass the comprehensive examination or the final oral examination (defense of thesis/dissertation) for an advanced degree, his/her committee must report to the Graduate Studies Office, within seven days of the examination, the failure together with the committee's recommended action. If this recommendation allows another examination, the committee should indicate what the student must do prior to such re-examination. No student shall be permitted to take either the comprehensive or final oral examination more than twice and the student must wait a minimum of three months before retaking the examination.

Grading system. Graduate students are graded by letter grades as follows: A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D-, P (Pass), F (Fail), WP (Withdraw Passing), WF (Withdraw Failing), and I (Incomplete). Only a Pass/Fail grade is to be used for research projects, thesis or dissertation work. The grade of "I" is to be used by an instructor at the end of a term to designate incomplete work in a course. It is used when a student, due to extenuating circumstances such as illness, military service, hardship or death in the immediate family, is unable to complete the requirements of the course in the term in which the student is registered for credit. A grade of Incomplete is given only if a student has already substantially completed the major requirements of a course. Each instructor must judge each situation.

The instructor must also indicate by a departmental record, with a copy to the student, how and by when the Incomplete is to be removed, and if he/she is at the University at the time of the removal, supervise the makeup work and report the permanent grade. In the event that the instructor is not available at the time of the student's application for removal of an Incomplete, the department chairperson shall supervise the removal of the Incomplete and turn in the permanent grade for the student.

Grades of Incomplete must be completed within one semester after they have been awarded or they will be automatically changed to a grade of F. Any extensions to the one-semester time frame must be arranged with the Dean for Graduate Studies prior to the Incomplete being changed to a grade of F.

A student with two or more current grades of Incomplete will not be permitted to enroll in any new courses until the number of current Incomplete grades becomes less than two.

All grades of "I" on courses which are part of the degree requirements must be removed at least one month before the final oral/written examination for the Master's or Ph.D. degrees.

The following quality points are given for courses completed:
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<tr>
<th>Grade</th>
<th>Quality Points</th>
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<tbody>
<tr>
<td>A+</td>
<td>4.0</td>
</tr>
<tr>
<td>A</td>
<td>4.0</td>
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<tr>
<td>A-</td>
<td>3.67</td>
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<tr>
<td>B+</td>
<td>3.33</td>
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<tr>
<td>B</td>
<td>3.0</td>
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<tr>
<td>B-</td>
<td>2.67</td>
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<td>C+</td>
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<td>C</td>
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<td>D+</td>
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<td>D</td>
<td>1.0</td>
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<td>D-</td>
<td>0.67</td>
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<td>F</td>
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Grade point averages are determined by multiplying the quality points earned in each course by the number of credit hours for that course, adding the products for all courses, and then dividing the sum by the total number of credit hours in which quality points were earned. Grades of Pass are not used in determining grade point averages.

A student may repeat a course in which he/she has previously received an unsatisfactory grade with the approval of the student's advisor, course instructor, and the Dean for Graduate Studies. A student registering for such a course should notify the Office of Academic Records of re-registration in the course. Both grades will appear on the transcript but only the last grade will be used in determining the grade point average.

**Transfer of credit**

All graduate credits to be counted toward the satisfaction of subdoctoral degree requirements — including all transfer credits — must be approved and recommended by the cognizant Graduate Committee of the student's major department or area. Not less than 50 percent of the course work required for any subdoctoral graduate degree must be completed at the University of Nebraska. No graduate credit will be accepted for transfer unless earned at an institution fully accredited to offer graduate work; nor should the student expect any graduate credits to be transferred unless the Graduate Committee evaluates the quality and suitability as equal to or superior to offerings available at the University of Nebraska.

Students should order official transcripts of graduate work taken elsewhere at least one semester before the student intends to graduate. Transcripts should be sent to the Graduate Studies Office, University of Nebraska Medical Center, 987810 Nebraska Medical Center, Omaha, Nebraska 68198-7810.
Requirements for graduate degrees

The general requirements for the Master's and Doctor of Philosophy degrees conferred upon the recommendation of the Graduate College are discussed on the pages immediately following. Students must also become familiar with whatever additional requirements their specialty requires. These are set forth in this Bulletin under the departmental course listings and in departmental program descriptions which may be provided to students at the time of their admission.

Requirements for the Master's Degree

Residence and time requirements. Not less than 50 percent of the course work required must be completed on the campuses of the University of Nebraska after the student has been formally admitted and registered in the Graduate College. Appropriate courses may be taken with departments located on other campuses of the University of Nebraska.

The work required for a Master's degree must be completed within five consecutive calendar years. Upon the recommendation of the program Graduate Committee concerned, a graduate student may apply to the Dean for Graduate Studies for permission to take a special examination, or the current session final examination, in courses for which graduate credit has been recorded and is obsolete. A report of the results of the examination, which shall be prepared, given, and graded by the department, shall be filed in the Graduate Studies Office. Unless a grade of B is obtained on the examination, the student shall be required to take additional work, the amount and nature of which will be recommended by the program Graduate Committee for approval by the Dean for Graduate Studies.

Graduate committees. Each graduate program has a Graduate Committee of three or more members formally appointed by the Dean for Graduate Studies but selected or elected by the program Graduate Faculty. Each new graduate student should consult the chair of his/her Graduate Committee for assignment to an adviser. The Graduate Committees supervise the work of candidates for the Master's degree. They may give such tests as are necessary to determine whether the applicants are adequately prepared for graduate study. The Graduate Committees may select from the Graduate Faculty a three-member Advisory Committee to supervise a Master's student. At least one of the Advisory Committee must be a Graduate Faculty Fellow. These Advisory Committees will act on behalf of and report to their respective Graduate Committees.

Admission to candidacy. Admission to the Graduate College does not necessarily imply admission to candidacy. A student may be admitted to candidacy for a Master's degree on recommendation of the appropriate Graduate Committee and after approval by the Dean for Graduate Studies. A student must be admitted to candidacy prior to the start of the semester in which the student plans to graduate.

Options for the Master's Degree. The Graduate College, except in programs where such a choice is not given, offers the degree of Master of Science or Master of Science in Nursing under two options. In choosing an option the student should be guided by the type of training that is appropriate for the student's academic, professional and career goals. A student may not change options for the Master's degree after having been admitted to candidacy except under unusual circumstances and only with permission of the Dean for Graduate Studies after recommendation by the Graduate Committee.

Course requirements for the Master's degree under either option may be met (1) with approved courses selected from those offered in any department which has been approved to offer a program leading to the Master's degree, or (2) by approved courses selected from those offered in some field of study within a specific department or group of departments which has been approved by the Graduate Council. If a graduate program has an established core curriculum, students admitted to that program must meet only the course requirements for that program. Graduate students admitted to a graduate program that does not have an established core curriculum must meet the minimum course requirements outlined in the following paragraphs.
UNMC offers a program on matters of Responsible Conduct in Research. Master’s students are encouraged to attend this program.

Option One should be chosen by those who are preparing for careers in research and scholarly work. Under this option, a candidate must complete at least six graduate courses, three of which may be "introductory" courses (800 level with 600 level or lower counterparts). A Master’s thesis must be completed in the candidate’s research area. Candidates are encouraged to submit data contained in the thesis for publication before completion of the degree requirements.

Regular participation in the seminar program of the major area of study is a requirement for all students. The Graduate Committee or the student’s Advisory Committee may also require the student to complete various techniques courses, language courses, research courses, special topics, etc., as necessary, but none of these courses may be used to meet the requirements for the six graduate courses.

The subject of the thesis must be approved by the Graduate Committee. The thesis work should reveal a capacity to carry on independent study or research and should demonstrate the student’s ability to use the techniques employed in the field of investigation. The thesis must conform to the style accepted at UNMC. Specimens may be examined in the McGoogan Library of Medicine.

The thesis must be presented in final form to the Graduate Committee or the student’s Advisory Committee at least two weeks before the date for the candidate’s final oral examination (defense of thesis). A candidate shall not be eligible for the defense until the thesis is completed and approved by the major adviser.

When the thesis defense has been completed successfully, one copy of the thesis must be supplied to the major department and two copies must be deposited in the McGoogan Library of Medicine. To meet requirements for completion of the degree in a given semester, the approved thesis and evidence of the successful defense must be in the Graduate Studies Office one week before the end of the semester.

Option Two is offered in certain departments upon the advice and with the approval of the major adviser and the program Graduate Committee. This option permits more intensive work in formal courses and does not require a thesis. Students who have earned the Master’s degree under Option Two and later elect to continue in graduate work for the degree of Doctor of Philosophy must give evidence of ability to conduct independent research, which may require them to spend somewhat more than the minimum time in completing the requirements for the doctoral degree.

Under Option Two, a candidate must complete eleven graduate courses, four of which may be "introductory" courses (800 level with 600 level or lower counterparts). Since Option Two is not a research degree, no more than two of the 11 courses may be Research Other Than Thesis. Participation in a seminar in the student’s major field also is required.

**Examinations.** A written and/or oral comprehensive examination is required to cover the student’s approved program of study, as specified by the student’s Graduate Committee. The comprehensive examination must be taken no sooner than ten months prior to the completion of degree requirements. The Graduate Studies Office must be notified of the date of the comprehensive examination and the names of the examining committee members not later than two weeks prior to the examination.

The report of the outcome of the examination must be filed on the appropriate form in the Graduate Studies Office within seven days following the examination. The comprehensive examination must be passed at least one week prior to the time the final oral examination is scheduled.

For the defense of thesis (final oral examination), the examining committee, appointed by the Dean for Graduate Studies upon recommendation of the Graduate Committee, shall consist of at least
three members and may be the student's Advisory Committee. One member of the examining committee must be a Fellow of the Graduate Faculty. A report of the outcome of the final oral examination must be filed in the Graduate Studies Office within seven days following the examination.

If more than one member of the examining committee recommends failure in a comprehensive examination or defense of thesis (final oral examination), the student shall be considered to have failed the examination. In the event of failure, the examining committee shall within seven days recommend to the Dean for Graduate Studies whether the student should be given the option of retaking the examination and, if so, the committee shall identify general areas of weakness which require special attention and any remedial actions which the student should complete prior to re-examination.

No student shall be permitted to take either the comprehensive examination or defense of thesis (final oral examination) more than twice, and the student must wait a minimum of three months before retaking the examination. The same committee shall give the re-examination unless the Graduate Committee responsible for the student's program recommends and the Dean for Graduate Studies approves a substitution.

**Summary of procedure for the Master's Degree**

This summary of procedure should be studied carefully in connection with the Graduate Studies calendar.

1. Admission to the Graduate College.

2. Registration by consultation with the chair of the Graduate Committee and/or the major adviser and with the approval of the Dean for Graduate Studies.


4. Filing of an application for the diploma at the Office of Academic Records and payment of the $25 graduation fee by the appropriate deadline. This application is effective during the current term only. It must be renewed at the appropriate time if requirements for graduation are not completed until a later term.

5. Admission to candidacy before the start of the semester in which the student plans to graduate, upon recommendation of the Graduate Committee and approval of the Dean for Graduate Studies.

6. The Application for Completion of Requirements for Master's Degree must be received in the Graduate Studies Office at least four weeks before the final oral examination, if required, but in no case later than four weeks before the calendar date for filing the final report for degree. The application will be accepted after the typewritten thesis has been approved by the adviser under whose direction the work was done and after any outstanding grades of "Incomplete" have been removed.

7. Under Option One the thesis in final form must be presented to the Graduate Committee or the student's Advisory Committee not later than two weeks prior to the date of the final oral examination.

8. Passing of the comprehensive examination at least one week prior to the time the final oral examination is to be taken. The Request for Scheduling Comprehensive Examination form must be received in the Graduate Studies Office two weeks before the proposed date of the examination. The Examination Report Form must be received in the Graduate Studies Office within seven days following the examination.
9. Passing of a final oral examination, if required, as scheduled before the examining committee. A report of the outcome of the examination must be filed in the Graduate Studies Office within seven days following the examination.

10. Presentation of two copies of the thesis to the Graduate Studies Office before deposition of the copies of the thesis in proper form with the Director of the McGoogan Library of Medicine. Delivery to the Graduate Studies Office of the Application for Completion of Requirements for Master’s Degree signed by the examining committee and the Director of the McGoogan Library of Medicine at least one week before the end of the term. In addition, one bound copy of the thesis is to be deposited with the student’s major department.
Requirements for the degree of Doctor of Philosophy

The Graduate College has established a residency requirement for the purpose of ensuring that the doctoral program should be reasonably compact, continuous, coherent, and that a substantial portion be done at the University of Nebraska or under supervision of the faculty of the University of Nebraska. For any student beginning a doctoral program at the University of Nebraska Medical Center, the residency requirement for the Ph.D. is that at least one-half of the course requirements (other than dissertation) be completed within a consecutive eighteen-month period, with the further provision that the courses be taken after receipt of the Master’s degree or its equivalent. Attendance at seminars also is required.

In exceptional circumstances, when it is clear that the purpose of residency will be fulfilled although the above formal conditions are not met, the student’s Supervisory Committee may, with the approval of the Dean for Graduate Studies, recommend alternative procedures for satisfying the residency requirements. The plan for satisfying residency requirements shall be a part of the student's approved program.

A minimum of four full years of graduate study is normally required to complete a program for the degree of Doctor of Philosophy for a student who enters the program with the Bachelor’s Degree. Neither the courses completed nor the time spent in study determines completion of requirements for the Ph.D. degree. It is earned primarily through the pursuit of excellence in some special field of scholarship which involves the demonstrated ability to conduct independent research.

The Ph.D. degree must be completed within seven years from the date of initial registration as a Ph.D.-objective student.

To complete the Ph.D. degree, certain minimal course requirements must be met. For most programs this is accomplished by taking a core of courses defined by each of the programs. Students admitted to a graduate program that does not offer a core curriculum must meet the following minimum course requirements.

The student must complete at least nine graduate level courses, only three of which may be "introductory" courses (800 level with 600 level or lower counterparts). Although the student’s Supervisory Committee may require non-dissertation research work, special topics or techniques courses, foreign language courses, etc., none of these may be used to meet these basic course requirements. It is the responsibility of the Supervisory Committee in conjunction with the Graduate Committee to ensure adequate didactic preparation of the student. UNMC offers a program on matters of Responsible Conduct in Research. All Ph.D. graduate students must attend this program at least once.

All students are required to participate in the seminar program within their major area. A dissertation of publishable quality must be completed and successfully defended (see below). In addition, evidence must be presented that the dissertation material has been submitted for publication in a peer review journal.

Qualifying procedure. Certain programs may require specific qualifying procedures and/or examinations which must be completed during the early phases of study. Departmental or program qualifying requirements are designated in sections of this bulletin which describe each program or in guidelines provided by the individual programs. If a qualifying examination is required, the majority vote of the examining committee is required to pass the examination.

The Request for Scheduling the Qualifying Examination must be received by the Graduate Studies Office two weeks prior to the examination, and the report of the outcome of the examination must be filed on the appropriate form in the Graduate Studies Office, within seven days following the examination.
Supervisory Committee and program of studies. Upon recommendation of the program Graduate Committee, the Dean for Graduate Studies shall appoint for each student a Supervisory Committee of at least four members, all must be Graduate Faculty. It is urged that one or more members of the Supervisory Committee be from a field or fields of study different from the major area of interest, whenever such representation will contribute to the student's program and/or the overall effectiveness of the graduate program.

Faculty from outside the University of Nebraska may serve as members of the Supervisory Committee. As with other members of the Committee, these individuals are appointed by the Dean for Graduate Studies upon recommendation of the program Graduate Committee. Within four weeks of its appointment the committee shall meet to designate and subsequently to file in the Graduate Studies Office a proposed program of studies, including designation of all required courses and the general area of research for the dissertation. Any subsequent change in the program or in the dissertation topic shall be approved by the Supervisory Committee and the action reported to the Graduate Studies Office.

Comprehensive examination and admission to candidacy. When a student has substantially completed his/her didactic studies, he/she must pass a comprehensive examination which may consist of several parts. The comprehensive examination is not a repetition of course examinations but is an investigation of the student’s breadth of understanding of the field of knowledge of which his/her special subject is a part.

At the discretion of the Supervisory Committee or as a program requirement, the student may be required to pass either an oral or written comprehensive examination, or both.

The Supervisory Committee or program Graduate Committee arranges for the written and/or oral comprehensive examination. The Request for Scheduling the Comprehensive Examination form must be received by the Graduate Studies Office not later than two weeks prior to the examination. The report of the outcome of the examination must be filed on the appropriate form in the Graduate Studies Office within seven days following the examination. If more than one member of the Supervisory Committee recommends failure, the student shall be considered to have failed the examination.

In the event of failure the Supervisory Committee shall recommend to the Dean for Graduate Studies whether the student should be given the option of retaking the examination and, if so, the Committee shall identify general areas of weakness which require special attention and any remedial actions which the student should complete prior to re-examination. No student shall be permitted to take either the written or oral portion of the comprehensive examination more than twice.

When the student has passed the comprehensive examination and satisfied the requirements of his/her approved program, as well as other requirements of the Supervisory Committee, the committee will recommend to the Graduate Studies Office the student’s admission to candidacy for the Ph.D. degree. Such a report must be filed at least seven months prior to the final oral examination (defense of dissertation).

A student is formally recognized as a candidate as of the date of completing the comprehensive examination. If the term of candidacy is extended beyond three years, the candidate must pass another comprehensive examination. Following admission to candidacy the student must be continuously registered in the Graduate College until receipt of the Ph.D. degree. Students not in residence may register for a minimum of one semester hour credit in dissertation. Failure to maintain continuous registration will result in the termination of candidacy.

Dissertation. The dissertation is not of fixed length. It should treat a subject from the candidate’s field as approved by the Supervisory Committee. It should show the student’s technical mastery of the field and should advance or modify former knowledge; i.e., it should treat new material, or find new results, or draw new conclusions, or it should interpret old material with new insights. Each candidate for the degree shall submit with the dissertation an abstract, not exceeding 350 words in
length including the title. Before completion of the degree there must be evidence that the
dissertation material has been submitted for publication in a peer review journal.

The dissertation and abstract are to be presented to the members of the Supervisory Committee at
least four weeks before the final oral examination (defense of dissertation). It is the student's
responsibility to ensure that, at that time, the dissertation has been properly formatted and has
been thoroughly checked for errors in terminology, grammar and spelling. During the ensuing period
of at least two weeks, the members of the Supervisory Committee will have the opportunity to
review the dissertation to determine whether it is in a fit condition, based on formatting, writing
quality and preliminary scientific criteria, for the defense. Upon receiving such approval (or if no
serious objections are raised), the Application for the Final Oral Examination (Defense of
Dissertation), signed by the student and the major advisor, should be submitted to the Graduate
Studies Office. The defense will then be scheduled no sooner than two weeks after receipt of that
form.

Following the successful completion of the defense (see below), two copies of the dissertation and
three copies of the abstract must be presented to the Graduate Studies Office before being
deposited by the student in the McGoogan Library of Medicine. The first page of one copy of the
dissertation shall bear the signatures of all members of the Supervisory Committee who approve the
dissertation. The first page of the second copy shall indicate the names (typed) of all members of
the Supervisory Committee who signed the original title sheet. This typed title sheet will be
microfilmed with the dissertation.

The student must also present to the library a signed agreement for the publication of the abstract
and microfilming of the dissertation. To meet requirements for completion of the degree in a given
semester, the approved dissertation and evidence of the successful defense must be in the Graduate
Studies Office one week before the end of the semester.

Before the degree is granted, each candidate will pay a fee to cover the cost of microfilming the
entire dissertation and of publication of the abstract in Microfilm Abstracts published by Xerox
University Microfilms of Ann Arbor, Michigan.

**Defense of dissertation.** This final examination is oral and public. It is given by the Supervisory
Committee after all other requirements have been met. The Committee also determines the
character and length of the defense. The examination may be devoted to the special field of the
dissertation or to related matters, or it may be designed to test the candidate's judgment and critical
powers.

The defense of dissertation will not be scheduled unless the Chair of the Supervisory Committee and
at least two other members of the committee are available for the examination. Exceptions may be
made only by permission of the Dean for Graduate Studies.

A report of the outcome of the defense of dissertation must be filed in the Graduate Studies Office
within seven days following the examination. If more than one member of the Supervisory
Committee recommends failure, the student shall be considered to have failed the examination. In
the event of failure, the Supervisory Committee shall recommend to the Dean for Graduate Studies
whether the student should be given the option of retaking the examination and, if so, the
Committee shall identify general areas of weakness which require special attention, and any
remedial actions which the student should complete prior to re-examination. No student shall be
permitted to take the final oral examination more than twice and the student must wait a minimum
of three months before retaking the examination.

**Summary of procedure for the**
**Doctor of Philosophy degree**

This summary of procedure should be studied carefully in connection with the Graduate Studies
calendar.
1. Admission to the Graduate College.

2. Registration after consultation with the adviser and with the approval of the Dean for Graduate Studies.

3. Satisfactory completion of any qualifying requirements.

4. Appointment by the Dean for Graduate Studies of a Supervisory Committee on the recommendation of the departmental or area Graduate Committee.

5. Submission to the Graduate Studies Office of a program approved by the Supervisory Committee setting forth the proposed plan of study for the degree prior to completion of more than half of the total requirements.

6. Satisfactory completion of any foreign language or research tool requirements set forth in the approved program. Passing of the comprehensive examination when the student's program of courses is substantially completed. The Request for Scheduling Comprehensive Examination form must be received in the Graduate Studies Office two weeks before the proposed date of the examination. The Examination Report Form must be received in the Graduate Studies Office within seven days following the examination.

7. Admission to candidacy for the Ph.D. degree by filing a report in the Graduate Studies Office of the passing of the Comprehensive Examination (at least seven months before the final oral examination). The term of candidacy is limited to three years.

8. Filing of an application for the diploma at the Office of Academic Records and payment of the $25 graduation fee by the appropriate deadline. This application is effective during one term only. It must be renewed at the appropriate time if requirements for graduation are not completed until a later term.

9. Presentation to the Graduate Studies Office of evidence of submission of dissertation material to a peer review journal.

10. Presentation of the dissertation and the abstract to the Supervisory Committee at least four weeks prior to the final oral examination.

11. Presentation to the Graduate Studies Office of the application for the final oral examination at least two weeks prior to the date of that examination.

12. Passing of final oral examination and submission of a report of the outcome of the examination to the Graduate Studies Office within seven days following the examination.

13. Two copies of the dissertation in proper form, and three copies of the abstract, presented to the Graduate Studies Office. These same two copies of the dissertation, one copy of the abstract, and the signed agreement for microfilming the dissertation and publication of the abstract must be deposited with the Director of the McGoogan Library of Medicine. Payment of the abstract fee and optional copyright fee. Delivery of the Report on Doctoral Degree, signed by members of the Supervisory Committee, the Director of the McGoogan Library of Medicine, and the Cashier, to the Graduate Studies Office. In addition, one bound copy of the dissertation is to be deposited with the student's major department.
General information

Registration

Registration is accomplished before each academic term. Information and instructions regarding registration are circulated prior to the date of registration. Students must be formally admitted to the Graduate College to register in graduate courses.

Information about tuition and fees

Tuition and fees charges are subject to future change without notice. The following information, therefore, is offered as a guideline, not as a firm commitment. Tuition is based on the number of hours enrolled.
During the 2006-2007 academic year, the tuition rates for graduate courses are:

**Graduate nursing courses:**
- Nebraska resident: $229.50 per semester hour
- Nonresident: $640.50 per semester hour

**All other graduate courses:**
- Nebraska resident: $211.50 per semester hour
- Nonresident: $569.75 per semester hour

Prospective students should always inquire at the Student Financial Services Office to obtain the latest information on tuition and fees.
Tuition may be paid in full the first day of classes and must be paid not later than due date appearing on statement mailed to student.

Miscellaneous fees and charges
 Fees that may be applicable to graduate students include the following:
- Graduate College application fee $45.00
- UPFF-University Program and Facility Fee Fund A (semester) $5.00
- UPFF Fund B-Student Health Facility (semester) $99.75
- UPFF Fund B-Facility Maintenance/Service Fee (semester) $47.50
- Student health insurance (basic plan/semester) $396.00

**Special service fees:**
- Transcript of grades $5.00
- Abstract fee, Ph.D. degree $55.00
- Copyright fee (optional) $45.00
- Thesis/dissertation binding, per copy (Pay at library) $10.00
- Graduation Fee (non-refundable) $25.00
- Bad check charge $20.00

**Deposits:**
- Keys, (refundable) inside door $10.00; outside door $15.00

**Late fees:**
- Late registration $10.00
- Late payment of tuition and/or fees $20.00
- Disenrollment fee $100.00

**Other fees:**
- Add/drop course $10.00
- Replacement of student identification card $10.00
- Library fee $2.00/credit hour
- Distance Education Fee $60.00/course
- Distributive Learning Fee (graduate nursing) $75.00/semester

Some courses require payment of a laboratory or course related fee — these will be indicated on the Summary of Courses. A detailed list of fees is published in the UNMC Student Handbook.

Tuition refund policy
Students who withdraw may receive a refund of a portion of their tuition for the term in which they are registered. (See the UNMC Student Handbook.)

Application for the diploma

Each student who expects to receive a diploma must file an application for the diploma in the Office of Academic Records and pay a $25 non-transferable, non-refundable graduation fee. Announcements concerning deadlines for applications are posted throughout the campus and published in the internal communications of the Medical Center and on the UNMC student website.

Commencement exercises

Commencement attendance is required, unless explicitly excused by the Dean for Graduate Studies, for those completing degree requirements when a formal commencement is offered — usually in May and December. Those graduating in August have the privilege of participating in the next formal commencement.

Audit

A course may be audited with the permission of the instructor and the Dean for Graduate Studies provided that the student is academically qualified, there is adequate space and facilities, and the student is interested in the course but does not wish to earn academic credit. The student’s adviser is normally consulted in this process. Application forms for auditing courses may be secured from the Office of Academic Records. The cost for auditing a course is one-half the current resident tuition. Arrangements must be made to audit of a course before the final date for adding a course.

Drops and withdrawals

Students may drop a course (see below for circumstances where students withdraw from the University) at any time during the first eight weeks of the semester. After the first week, a grade of "W" will appear on the transcript. The approval of the student’s adviser, the instructor of the course, and the Dean for Graduate Studies is required. No student may drop a course after the deadline dates unless the student is able to demonstrate that conditions unforeseen at the time of registration, such as illness, will not permit continuance in the course. These unforeseen conditions will in no case be considered to include unsatisfactory scholarship. Students withdrawing from the University are required to initiate their withdrawals in the Office of Academic Records. Grades are assigned by the instructor on the date of withdrawal. A grade of WP is given if the student is considered to be doing passable work; a grade of WF is given if the student is considered to be doing failing work at the time. The withdrawal form must be completed with appropriate signatures to insure appropriate entries for the permanent record.

Employment and registration

Graduate students holding major fellowships or traineeships are expected to be enrolled in a full program of studies and are not to engage in other remunerative employment without permission of the Dean for Graduate Studies.

Graduate students who are not employed, or graduate research assistants who are performing duties that are 100 percent thesis/dissertation related, may register for a maximum of 15 credit hours during a semester, 6 credit hours during one five-week summer session, 9 credit hours during one eight-week summer session, or 3 credit hours during a presession.

Graduate students who are employed are not to exceed registration limitations established by the Graduate Council. These limitations reflect the fact that graduate-level course work serves mainly as a guide for independent, scholarly study. Graduate students are expected to master the course subjects and to devote substantial time in independent library and laboratory investigation beyond
minimum credit hour requirements. Graduate students who are employed, hold a teaching assistantship, or hold a research assistantship that is not thesis/dissertation related must not exceed the following registration limitations:

<table>
<thead>
<tr>
<th>Hours employed per week</th>
<th>Semester</th>
<th>8-week summer session</th>
<th>5-week summer session</th>
<th>3-week summer session</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-15</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>18-22</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Full time</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Any exception to these registration limits requires permission from the Dean for Graduate Studies upon recommendation of the committee in charge of the student’s program.

**Full-time status**

Graduate students requiring certification as full-time students must be enrolled for at least 9 credit hours during a semester, at least 4 credit hours during an eight-week session, or at least 3 credit hours during a five-week session, whether or not the student holds a graduate assistantship. With approval of the Dean for Graduate Studies, students in the final semester of a Master’s degree program or candidates for doctoral degrees registered for fewer than the minimum hours required for a full program may be granted full-time status provided they are not employed more than 20 hours per week (half-time).

**Intercampus registration**

Graduate students in good standing who wish to register for courses on a University of Nebraska campus other than their home campus must complete an intercampus registration form available on-line at [https://net.unmc.edu/care](https://net.unmc.edu/care) or on this website under "Registration Information". After the form is processed, you will be contacted by the host campus for further registration instructions.

**Residency requirements**

Each term, students are asked to certify their residency as part of the registration procedure. Students who reside in a state other than Nebraska or who have recently moved to Nebraska must apply for resident status. The Office of Academic Records has full information on the requirements for residency and the forms for applying for resident status.

**Interstate reciprocity agreement for graduate education**

Under an agreement between the Board of Regents of the University of Nebraska and the Board of Curators of the University of Missouri, graduate students meeting the regular in-state requirements of the University of Missouri shall be regarded as in-state students at the University of Nebraska with respect to admission requirements, tuition and fees, scholarships, fellowships, and assistantships and other benefits normally available to Nebraska residents. Residency needs to be verified through the University of Missouri with a letter being sent to Academic Records.

**Services for veterans**

All men and women planning to attend UNMC under Chapters 31, 34, and 35, and 1506, the educational assistance and vocational rehabilitation laws administered by the Veterans Administration, should inquire at the Office of Academic Records before they register to make sure all necessary steps have been taken.
Financial assistance

**Loans.** Students who need to borrow funds for college expenses should inquire at the Financial Aid Office, 402-559-4199 or jdwalker@unmc.edu.

**Assistantships.** A number of teaching or research assistantships are available from various departments within UNMC. All inquiries regarding assistantships should be directed to the department. Graduate assistants must be registered during the period of their appointments unless specifically excused by the Dean for Graduate Studies.

A student on appointment as a Graduate Teaching or Research Assistant is eligible to pay tuition and fees at resident rates if the stipend received is equal to or greater than the non-resident tuition and fees for 9 credit hours during an academic year semester (3 credit hours during a five-week summer session, 4 credit hours during an eight-week summer session).

During 2002-2003, tuition for 12 hours credit per semester was remitted by the University for students on graduate assistantships with at least one-third time appointments. Students holding such appointments should check with the Graduate Studies Office at the time of registration to determine if they qualify for tuition remission.

**Fellowships and traineeships.** A number of restricted and unrestricted fellowships and traineeships are available to students at UNMC. To be eligible an applicant must be admitted to a graduate department or area with a degree objective. Students interested in applying for these fellowships should contact the Graduate Studies Office for information. Fellowship recipients are expected to devote full time to graduate study during the period of their appointment and may not engage in remunerative employment without the permission of the Dean for Graduate Studies.

Student rights and responsibilities

The Bylaws of the Board of Regents at the University of Nebraska protect the rights of each member of the University community. Each individual has the right to be treated with respect and dignity, and each has the right to learn. With these rights comes the responsibility of each individual to maintain an atmosphere in which others may exercise their human rights and their right to learn. Chapter V of the Bylaws fully delineates the rights and responsibilities of students.

Access to student records

In accordance with federal law as established in 1974 by the Family Educational Rights and Privacy Act, the University of Nebraska Medical Center maintains the confidentiality of student records and allows students to inspect and review information in their educational records at the Medical Center. The UNMC policy statement concerning student records may be found in the current UNMC Student Handbook or in the Office of Academic Records.
I. Introduction

Under the provisions of the Bylaws of the Board of Regents, students may appeal grades or other evaluations of their academic progress which they believe to have been prejudiced or capricious. In those cases in which informal attempts fail to resolve the problem, appeals or complaints should henceforth be made in writing to the appropriate individual or group as described below. All participants should act as expeditiously as possible to resolve the matter.

In cases of appeals concerning matters other than grades the campus Graduate Council will serve as the Appeals Committee. For purposes of considering appeal of grades and other course evaluations (see Section IV), the campus Graduate Council will reconstitute itself as a Graduate Faculty-Student Appeals Committee. It will be augmented by an additional student to be recommended by the Graduate Student Association. In the absence of a functioning Graduate Student Association, the additional student representative would be selected by the Dean for Graduate Studies.

In these deliberations, both students will be voting members of the Graduate Faculty-Student Appeals Committee. The Dean for Graduate Studies will not be present during deliberations of the Graduate Faculty-Student Appeals Committee; a member other than the Dean will act as chair. Any members of the Appeals Committee who has a conflict of interest in the case (e.g., same department or program as one of the parties, on the supervisory committee, etc.) should be replaced through ad hoc appointment(s) made by the Dean for Graduate Studies.

II. Intercampus students

When a student's graduate program consists of registrations essentially or entirely on one campus, the Appeals Committee of the campus administratively responsible for the program will constitute the appeal board.

When a student's graduate program includes substantial registrations on a campus other than the one administratively responsible for the program, three members of the Appeals Committee for the other campus will be designated by the Dean for Graduate Studies on that campus to augment the Appeals Committee on the campus administratively responsible for the program. In this case, the augmented Appeals Committee will constitute the appeal board.

The decision concerning augmentation of a campus Appeals Committee for a specific appeal involving registrations on a campus other than the one administratively responsible for the student's program will be made by the Deans for Graduate Studies on the campuses involved.

III. Appeal of matters other than grades

A. Graduate students holding admission with unclassified status in the Graduate College, admission with a master's objective, or admission with a doctoral objective (but prior to the appointment of a doctoral supervisory committee) should use the following procedure for appeals concerning general academic matters, other than grades or other course evaluations (e.g., constitution of programs, suspension or dismissal).

1. Initially, after official notification is received by the student, the appeal or complaint should be discussed with the student's adviser in an attempt to resolve the conflict informally.

2. If the matter is not resolved satisfactorily, the appeal or concern may be submitted in writing to the Departmental or Interdepartmental Area Graduate Committee administratively responsible for the student's program. This written appeal must be presented within thirty days after official notification of an action is received by the student.

3. If the appeal to the Graduate Committee is denied, within thirty days of receipt of the denial notice a written appeal may be made to the Graduate Council for the campus administratively responsible for the student's program. At this point the student may be accompanied and advised by legal counsel. During these proceedings, legal counsel may not cross-examine or otherwise formally
participate. The Graduate Council may also wish to have legal counsel present. Normally, the Graduate Council will be the final appeals body (for exceptions, see paragraph III C).

B. Graduate students holding admission with a doctoral objective in the Graduate College and for whom a doctoral supervisory committee has been appointed should use the following procedure for appeals concerning general academic matters or evaluations:

1. Initially, after notification is received by the student, the appeal or complaint should be discussed with the student’s adviser in an attempt to resolve the conflict informally.
2. If resolution is not achieved, the appeal may be submitted to the student’s supervisory committee within thirty days after the meeting which resulted in no resolution of the complaint.
3. If resolution is not achieved, the appeal may be submitted in writing to the Departmental or Interdepartmental Area Graduate Committee administratively responsible for the student’s graduate program within thirty days of receipt of the denial notice by the student.
4. If denied, a written appeal may be made within thirty days of receipt of the denial notice to the Graduate Council for the campus administratively responsible for the student’s graduate program. At this point the student may be accompanied and advised by legal counsel. During these proceedings, legal counsel may not cross-examine or otherwise formally participate. The campus Graduate Council may also wish to have legal counsel present. Normally, this will be the final appeals body (for exceptions, see paragraph III C.).

C. Role of the Executive Graduate Council

1. In most cases the decision of the campus Graduate Council will be final. Only under special circumstances the Executive Graduate Council hear an appeal from the decision of the campus Graduate Council. These circumstances are limited to occasions where the Executive Graduate Council believes that:
   a. The campus Graduate Council has violated some element of due process or fair procedure (example: the concerned parties were not allowed to present their cases fully to the Graduate Council).
   b. The campus Graduate Council has failed to examine or give adequate weight to important evidence relevant to one party’s position;
   c. The campus Graduate Council has given undue weight to evidence not pertinent to the case;
   d. Some gross miscarriage of justice would be perpetrated if the decision of the campus Graduate Council were allowed to stand.

   It is up to the discretion of the Executive Graduate Council to decide if any of these conditions exist.

2. Appeals to the Executive Graduate Council must be made in writing and must specifically outline the grounds for the appeal. Such appeal must be made within 20 working days of the day the decision of the campus Graduate Council is received (working days will not include those days the University is not in session).

3. The Executive Graduate Council must make a decision to hear the appeal or not to hear the appeal within 30 working days after receipt of the appeal. Acceptance or denial of jurisdiction over the appeal will be made in writing.

4. The decision of the Executive Graduate Council on the merits of the case will be made and transmitted to the concerned parties within 40 working days after the decision to hear the appeal.

5. No person who was a member of the department or campus Graduate Council involved in the case will be eligible to participate in the decisions of the Executive Graduate Council either to decide whether the case should be heard or to decide the merits of the case.

IV. Grade Appeals

Students who believe that evaluation of their academic progress in a course has been prejudiced or capricious, may appeal that grade or evaluation as follows:

A. Initially, an attempt should be made to resolve the matter through discussion with the instructor of the course for which the grade was received.

B. If the matter is not resolved satisfactorily, the appeal may be submitted in writing to the chair of the department in which the course was taken.

C. If the matter is not resolved satisfactorily, the appeal may be submitted in writing to the Graduate Faculty-Student Appeals Committee within two weeks following reporting or posting of the grade. This committee may change a student’s evaluation if there is sufficient evidence that the evaluation of a student by a faculty member has been improper. When a student takes a course in a
department that is administratively based on another campus, the student must follow the grade
appeals procedure for that campus. In cases involving dual-listed courses, appeals should be made
through procedures of the academic unit that granted admission to the course.
D. The Graduate Faculty-Student Appeals Committee will be the final authority in resolution of grade
appeals, except that either the student or the faculty member issuing the grade may within ten days
submit an appeal in writing to the Dean for Graduate Studies setting forth his or her reasons for
believing he or she was not accorded a fair hearing. The Dean will review the record and facts of the
case and may return the matter to the Committee for reconsideration. The decision of the Dean as
to whether the case should be reopened will be final.
Approved by UNMC Graduate Council: 2/22/79; amended 5/20/82 and 2/25/99

General procedures for student discipline actions

In accordance with Section 5.4 of the Bylaws of the Board of Regents and in order to insure the
protection of students’ rights, the University of Nebraska Medical Center has established general
procedures which must be followed if any disciplinary action is proposed against students. Students
will be informed in writing by the Dean for Graduate Studies of the specific charges, the supporting
evidence, and the proposed disciplinary action. The Dean for Graduate Studies will also inform
students of their right to appeal. The UNMC "Procedural Rules Relating to Student Discipline" may be
found in the UNMC Student Handbook.

Academic integrity and professional conduct

The University of Nebraska Medical Center has established a policy on academic integrity and
professional conduct. This policy may be found in the UNMC Student Handbook. All graduate
students are expected to adhere scrupulously to this policy. Cheating, academic misconduct,
fabrication, and plagiarism are viewed as serious matters and will lead to disciplinary action as
described in the UNMC Student Handbook under Procedural Rules Relating to Student Discipline.
Additional materials related to Responsible Conduct in Research can be found in the UNMC Student
Handbook.
Student Services

Health services for students

Students registered for five or more hours per semester are required to participate in the outpatient student health services as provided by the Department of Family Medicine; participation by students registered for less than five hours per semester is optional. Hospitalization and major medical costs are not covered for students by outpatient Student Health. These charges will be filed with your insurance carrier (for UNMC insurance, claim forms can be obtained from Patti George by calling 559-7276).

All graduate students registered for five or more hours per semester are required to have health and accident insurance through a student insurance program contracted by UNMC unless evidence of comparable coverage is provided. All UNMC students are required to be skin tested annually for tuberculosis and those who may have direct contact with patients or with material that may be contaminated with Hepatitis B virus must be immunized against Hepatitis B before there is any opportunity for such exposure. Specific details regarding Student Health Services, the student insurance program, and student immunization policies can be found in the UNMC Student Handbook.

Student health information can also be found at http://www.unmc.edu/familymed/studentthealth/

Counseling & student development center

The UNMC Counseling and Student Development Center offers a wide range of professional counseling services, including general problem-solving, individual psychotherapy, stress management training, couples counseling, career exploration, communication consulting, and academic performance enhancement. These services are provided free of charge to all UNMC graduate students and their significant others. Counseling Center staff members have master’s degrees in counseling or clinical social work, and the director is a licensed psychologist.

Counseling services are provided in a private, confidential environment. With the exception of life-threatening situations (clear danger to self or others), no information is released without the written consent of the client. Counseling files cannot be accessed through any UNMC or hospital computerized records systems. And since services are free, there is no need to file insurance claims.

In addition to personal counseling and consultation services, the center coordinates several student development programs designed to enhance the overall quality of campus life at UNMC.

These programs include:
- Student government advising and administrative support.
- The academic success program (study skills, learning style assessments, test-taking).
- Student clubs and organizations.
- The student insurance plan (policy revisions, claim filing).
- Substance abuse education.
- Services for disabled students.
- A variety of new student orientation activities.

Graduate students from all UNMC programs are invited to visit the Counseling Office located in the Student Life Center, third floor, room 3015. To schedule a counseling appointment or to ask questions, please call 559-7276.

Student Ombudsperson

UNMC has established an Ombudsperson system for all students, faculty and staff. The intent of the Ombudsperson Office is to help students and others resolve problems and to promote fair and equitable treatment for all members of the UNMC community.
Dr. David Carver has been designated as the primary Ombudsperson for the students at UNMC, but other individuals may also be utilized. Contact the Ombudsperson Office for more information on this service (402-559-2491).

**Educational resources**

Research laboratories containing modern equipment within the various colleges and institutes are available to students pursuing advanced research training. Modern computer facilities are available for graduate student research and education through the UNMC Computing Services.

The Leon S. McGoogan Library of Medicine is one of the country’s major health science libraries. The library’s collection numbers over 240,000 volumes, with a current journal list of 4,500 titles, over 3,500 of which are available in electronic format. The library’s catalog of books, journal holdings, and electronic resources such as MEDLINE and other health-related databases can be searched 24 hours a day both on and off campus from the Library's webpage at [http://www.unmc.edu/library](http://www.unmc.edu/library). However, licensor restrictions limit availability to some electronic journals to on-campus only.

Multimedia materials for computer-assisted instruction are collected and made available in the Sievers Facility for Interactive Instruction and adjacent Learning Resource Center. Reference and Education Services provide assistance and instruction with information needs, self-searching of numerous health related databases and understanding the concepts and scope of medical information management. Document delivery and interlibrary borrowing are also available, as are special services such as dissertation binding and medical and consumer health information services for the state of Nebraska.

**Student equity and multicultural affairs**

The goal of the Office of Student Equity and Multicultural Affairs (OSEMA) is to advance the equal education opportunity commitment of the University of Nebraska Medical Center by implementing recruitment and retention activities that identify and support students seeking a health care/research career with special emphasis on activities which target increasing the number of minority and disadvantaged persons entering and successfully completing the health/research careers educational pathways. The objectives of the office are to:

- Coordinate recruitment and retention activities with UNMC program units to recruit and retain qualified students with a special emphasis on recruitment and retention of underrepresented minorities and disadvantaged students.
- Promote retention by providing support services to enhance the performance of all enrolled students.
- Provide services for undergraduate students that will improve their chances for admission and sustain their interest in the career of their choice.
- Identify, motivate and prepare students at the pre-college level to explore and pursue health career options.
- Collaborate with UNMC departments, other educational institutions and community organizations to implement outreach programs that promote health career education.
- Participate in and initiate community relations efforts that promote health care careers and health care education at UNMC.
- Facilitate the continuing development of in-state and out-of-state affiliation agreements with other institutions of higher education to diversify the faculty and studies bodies.

**Student organizations**

**Graduate Student Association.** The Graduate Student Association of the University of Nebraska Medical Center (GSA-UNMC) is open to all students in an approved graduate program. The GSA-UNMC serves as a voice for the graduate students at the Medical Center, investigating and proposing solutions to problems unique to graduate students.
The GSA-UNMC annually elects a representative to the Medical Center Graduate Council.

**Medical Center Student Senate (MCSS).** The Medical Center Student Senate is the campus-wide student government body for the University of Nebraska Medical Center. The purpose of the MCSS is to provide student input and leadership on issues related to campus life and student development. MCSS also sponsors philanthropic events and social activities.

Senate members serve on a variety of UNMC committees and meet regularly with the Chancellor and other senior administrators. The President of the MCSS also serves as a non-voting member of the University of Nebraska Board of Regents.

MCSS business meetings are held on the first Wednesday of each month from September through May and are open to all students. Elections for the Graduate Studies senate seats and MCSS officers (President and Vice President) are held each November.

The MCSS administrative office is located in the Student Life Center, Room 3015. Students with questions about MCSS are encouraged to contact David Carver, Ph.D. or Patti George at 559-7276.

**New student organizations**
UNMC students who wish to establish a student organization and use campus facilities must receive formal recognition and approval. Application forms and guidelines can be obtained from the Counseling and Student Development Office, Student Life Center Room 3015 (phone 559-7276).
Programs and courses

Biochemistry and Molecular Biology

Graduate committee: Professor Batra (Chair); Professor Lin; Associate Professors Mehta and Borgstahl; Assistant Professor Sorgen.

Admission requirements for the Ph.D. and M.S. degrees. Students seeking admission must have a baccalaureate degree and should submit Graduate Record Examination scores as part of their application. Applicants must also have a comprehensive background in chemistry, including courses in general and organic chemistry. Courses in general physics, mathematics (including calculus) and general biology are also required. Students with limited course deficiencies can often correct these during their first year of graduate study.

Master of Science degree. Students studying for the Master of Science degree must matriculate in BRTF 821, 822, 823, and 824 and achieve a grade of B- or better in these courses. The number of other graduate-level courses required will vary with each student. Individual programs of study will be designed for each student by their advisory committee with the approval of the Graduate Committee. Students must achieve a grade of "B-" or better in all graduate-level courses and maintain an overall 3.0 graduate GPA.

Doctor of Philosophy degree. In addition to fulfilling general Graduate College requirements for the Ph.D. degree, students working for the Doctor of Philosophy degree must: Fulfill the scholarship requirements cited above for the Master of Science degree. Satisfactorily complete Biochemistry 925, 926, and 927 with a minimum grade of B- in each course. It is recommended that students matriculate in Biochemistry 850 during their first semester. Individual programs of study will be designed for students by their Supervisory Committees with the approval of the Graduate Committee. Participate in the departmental seminar program by attending weekly seminars and journal clubs. Students are required to give a journal club presentation each semester and register each semester for BIOC 970. Students are required to present a formal seminar during the semester after they become a candidate.

Combined degrees. Students enrolled in the College of Medicine may pursue a combined M.D. degree and a Ph.D. or M.S. degree. The student must meet all the admission requirements of the department and the Graduate College and be recommended by the Graduate Committee. Admission into this combined degree program requires approval by the Dean for Graduate Studies and the Dean of the College of Medicine. The Department of Biochemistry and Molecular Biology will work actively with the student to develop a schedule that will make most effective use of his/her time while studying for the combined degrees. The student should plan to spend a considerable block of time working exclusively on thesis/dissertation research in order to complete the graduate program. A detailed description of the department’s graduate program and advanced degree requirements are contained in the document, "A Guideline for Graduate Programs Leading to the Ph.D. and M.S. Degrees in Biochemistry and Molecular Biology." See the department’s Web site: http://www.unmc.edu/Biochemistry

Biochemistry and Molecular Biology (BIOC)

850 LABORATORY TECHNIQUES IN BIOCHEMISTRY AND MOLECULAR BIOLOGY, 2 cr I. Topics include: purification and characterization of proteins and nucleic acids; use of bacterial and mammalian expression systems and the structure and function of biological macromolecules. Prereq: Permission of instructor.

873 INTRODUCTION TO GENETIC SEQUENCE ANALYSIS, 2 cr (PAMM 873). Fundamentals of using online search techniques for the analysis of genetic sequence databases. The course will be taught in UNMC computer clusters by lecture and by the completion of assignments using computer
programs available on campus. Programming experience is not required. Prereq: Undergraduate course in biochemistry or molecular biology or permission of instructor.

880 PRINCIPLES AND METHODOLOGIES OF CANCER RESEARCH, 3 cr, I (CRGP 880, PAMM 880, PHSC 880, PHAR 880). The course surveys the biology and biochemical mechanisms underlying cancer development, prevention and therapy. Prereq: BRTP 821, 822, 823 and 824 or equivalent; permission of instructor.

896 RESEARCH OTHER THAN THESIS, 1-8 cr.
ADVANCED TOPICS IN BIOCHEMISTRY, A comprehensive and advanced coverage of the major areas of biochemistry and molecular biology. Reading and discussion of current literature are an integral part of these courses. Prereq: BRTP 821, 822, 823 and 824 and permission of instructor. Graduate Committee approval must be obtained before registering for courses in this series if the student has not had BRTP 821, 822, 823 and 824.

925 PROTEINS, MEMBRANES AND CELL REGULATION, 3 cr, II. This course examines the biochemistry of proteins and cell membrane components with emphasis on relationships between structure and function.

926 NUCLEIC ACIDS, 4 cr, I. Topics include physical and chemical properties of nucleic acids, genome organization, DNA replication and repair, transcription and regulation of gene expression. Emphasis on recent literature.

927 METABOLIC REGULATORY MECHANISMS, 2 cr, alternate yrs. This course examines various metabolic pathways with emphasis on their regulation and interrelationships. Major topics to be discussed include basic pathways for carbohydrates, lipids, amino acids, nucleic acids and metabolic diseases.

940 SPECIAL TOPICS, 1-3 cr presented at intervals depending upon the interest of the faculty or the request of students. A description of each course with its prerequisites is announced at the time the course is given.

970 SEMINAR, 1 cr. Prereq: Permission of instructor, staff.

899 MASTER’S THESIS

999 DOCTORAL DISSERTATION
Biomedical Research Training Program (BRTP)

821 MACROMOLECULAR STRUCTURE AND FUNCTION, 3 cr. Introduction to fundamental concepts in the biochemistry of macromolecules, including structure, characterization, purification, and functional analysis of proteins and nucleic acids. Prereq: Permission of instructor.

822 THE CELL AND GENE REGULATION, 2 cr. Introduction to fundamental concepts of cell structure, cell division, the experimental study of cells, and the regulation of gene expression. Prereq: Permission of instructor.

823 MOLECULAR CELL BIOLOGY, 2 cr. Fundamental concepts for understanding genetic analysis and cell function. Relationships between cellular function and biochemistry are examined in membrane transport, energy production, protein secretion, cytoskeletal structure/function, and cell specification. Prereq: Permission of instructor.

824 CELL SIGNALING, 3 cr. Introduction to fundamental concepts of cell signaling and cell regulation. Concepts include receptor systems, signal transduction, regulation of membrane potential, and the relationships between cell signaling and development, cancer, neurobiology, and immunobiology. Prereq: Permission of instructor.

896 RESEARCH OTHER THAN THESIS, 1-9 cr.

970 SEMINAR, 1 cr.
Programs and courses

Cancer Research

Graduate committee: Associate Professor Lahue (Chair); Professors Gold and Rizzino; Associate Professors Borgstahl, Solheim, and Wagner; Assistant Professor Ouellette.

Admission requirements for the Ph.D. and M.S. degrees.
The Cancer Research Graduate Program (CRGP) is an individualized program that considers each applicant's educational background, career goals and interests in the admissions process. Students interested in applying for the fall semester are encouraged to apply in January or February of that year. Students typically begin in the summer or fall semester. Spring admission is also possible.

CRGP admissions will require: (1) a bachelor's degree in chemistry, biology or a related science field. (2) Coursework in organic and inorganic chemistry, biology, physics and mathematics through calculus. Biochemistry is also recommended. Students can make up some deficiencies once admitted to the CRGP. For example, a summer school course can be completed prior to starting as a CRGP student. (3) Results from the Graduate Record Examination (GRE), including verbal, quantitative and analytical writing scores. The advanced chemistry, biology or biochemistry examination is recommended but not required. (4) Three letters of recommendation from scientists or other individuals who can assess the student's talents and training. (5) A statement of personal goals and career objectives. Research experience, while not required, is a major asset for admission. Applicants will be expected to interview with CRGP faculty unless there is a good reason to waive the interview. Foreign applicants will be required to meet UNMC Graduate Studies requirements for admission.

Master of Science degree. The CRGP program is intended to be for the training of Ph.D. students. The faculty recognize, however, that circumstances may warrant a student's leaving the program prior to completion of the requirements for the Ph.D. degree. An example for premature termination might include a change in the student's educational plans. The student may qualify for a master's degree provided that the following conditions have been met: (1) Completion of all didactic coursework (Macromolecular Structure & Function, The Cell and Gene Regulation, Principles and Methodologies in Cancer Research; at least two electives to be determined by the student's advisory committee; the annual Short Course in Cancer Biology; attendance at seminars, including presentation of an annual research seminar; and the Journal Club in Cancer Biology). (2) Completion of the comprehensive examination. (3) Completion of a research project consistent with a master's level achievement. (4) Completion and successful defense of a master's thesis. (5) Concurrence of the mentor and the student's advisory committee. (6) Concurrence of the CRGP Graduate Committee. Other requirements of the UNMC Graduate Studies program, such as Responsible Conduct in Research, must also be met.

Doctor of Philosophy degree. (1) Completion of all didactic coursework (Macromolecular Structure & Function, The Cell and Gene Regulation, Principles and Methodologies in Cancer Research; at least two electives to be determined by the student's supervisory committee; the annual Short Course in Cancer Biology; attendance at seminars, including presentation of an annual research seminar; and the Journal Club in Cancer Biology). (2) Completion of the comprehensive examination. (3) Completion of a research project consistent with a Ph.D. level of achievement. (4) Completion and successful defense of a doctoral dissertation. (5) Concurrence of the mentor and the student's supervisory committee. (6) Concurrence of the CRGP Graduate Committee. Other requirements of the UNMC Graduate Studies program, such as Responsible Conduct in Research, must also be met.

Cancer Research (CRGP)

880 PRINCIPLES AND METHODOLOGIES IN CANCER RESEARCH, 3 cr. (crosslisted with BIOC 880, PAMM 880, PHAR 880, PHSC 880). The course surveys the biology and biochemical
mechanisms underlying cancer development, prevention, and therapy. Prereq: BRTP 821, 822, or equivalent, or permission of instructor.

896 RESEARCH OTHER THAN THESIS, 1-9 cr.

940 SHORT COURSE IN CANCER BIOLOGY, 1 cr.

970 SEMINAR, 1 cr.

899 MASTERS THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Cellular and Integrative Physiology

Graduate Committee: Professors Carmines (Chair), Roy, Sansom; Associate Professor Padanilam. The Department of Cellular and Integrative Physiology offers programs of graduate training leading to the M.S. or Ph.D. degrees. The M.S. program is designed to provide background in physiology to enhance a career in allied fields such as medicine, bioengineering or dentistry. The Ph.D. program is designed to provide more comprehensive knowledge of mammalian physiology & biophysics, including the research and training required for the development of independent investigators.

Admission Requirements. Admission to the graduate program in Cellular and Integrative Physiology requires a bachelor's degree (or higher) in science from an accredited college or university, with a grade average of B or better. Students should have completed undergraduate courses in mathematics (through integral calculus), chemistry (at least 2 semesters in general, inorganic or analytical chemistry; organic chemistry and biochemistry are highly recommended), physics (2 semesters) and biology (2 semesters, preferably in the zoological sciences; vertebrate or mammalian physiology is highly recommended). Deficiencies in the required undergraduate coursework must be eliminated by the end of the first year of graduate study. Research experience also enhances the applicant's preparation for graduate studies in Cellular and Integrative Physiology. Results from the GRE or MCAT, transcripts, and three letters of recommendation are required of all applicants. Applicants for whom English is not their native tongue must submit TOEFL scores, with a minimum score of 600 (paper-based) or 250 (computer-based) usually required for admission. Students are selected for admission on the basis of composite science and math grade point average, overall undergraduate grade point average, standardized test scores, letters of recommendation, and the personal statement (see application form).

M.S. Degree (Non-Thesis Option). Students pursuing the M.S. degree (non-thesis option) in Cellular and Integrative Physiology must complete a compulsory core curriculum composed of the following courses: Graduate Physiology (PHYS 806), the 10 cr BRTP curriculum (BRTP 821, 822, 823 & 824), two advanced physiology electives (PHYS 914-930), Seminar (PHYS 970, each semester), and two graduate-level electives (minimum of 5 total credits; choose among PHAR 901-922 and PHYS 814-930; other courses upon approval of the Graduate Committee). No more than 3 cr of PHYS 896 can be applied toward the graduate-level electives requirement. The M.S. degree (non-thesis option) is awarded upon satisfactory completion of the core curriculum and passing the comprehensive examination (writing a review article in the style of Annual Review of Physiology).

M.S. Degree (Thesis Option). Students pursuing the M.S. degree (thesis option) in Cellular and Integrative Physiology must complete a compulsory core curriculum composed of Graduate Physiology (PHYS 806), at least 5 credits from the BRTP curriculum (BRTP 821-824), two advanced physiology electives (PHYS 914-930), Seminar (PHYS 970, each semester), Research Other Than Thesis (PHYS 896), and 8-10 cr of Masters Thesis (PHYS 899). The M.S. degree (thesis option) is awarded upon completing the core curriculum, passing the comprehensive examination (writing a review article in the style of Annual Review of Physiology), and completing a research project that results in a written thesis with an oral defense.

Doctor of Philosophy Degree.

Didactic Training: Ph.D. students in Cellular and Integrative Physiology must complete a compulsory core curriculum composed of Graduate Physiology (PHYS 806), 10 cr BRTP curriculum (BRTP 821, 822, 823 & 824), two advanced physiology electives (PHYS 914-930) and Seminar (PHYS 970; each semester until passing the comprehensive exam). The student's Supervisory Committee defines additional course requirements on an individual basis.

Research Training: During the first year of graduate study, students complete two semesters of Research Other Than Thesis (PHYS 896), which entails a research rotation in a different laboratory each semester. These rotations introduce the student to research, in terms of specific questions and
techniques as well as general aspects of research strategies and problem solving. After completion of the rotations, students select a faculty advisor and laboratory for their dissertation research project. The Cellular and Integrative Physiology faculty provide research expertise in a variety of fields, including cardiovascular physiology (cellular cardiac electrophysiology, microvascular function, neural control of circulation), neuroscience (neurophysiology, chemoreceptors in cardio-respiratory control), renal physiology (ion transport, mesangial cell function, neural control of volume homeostasis, renal microcirculation), reproductive endocrinology and visual physiology. Several laboratories focus on pathophysiological mechanisms associated with disease (e.g. acute renal failure, congestive heart failure, diabetes mellitus).

Students advance to Ph.D. candidacy by completion of a comprehensive examination consisting of the preparation (written) and defense (oral) of a grant proposal on a subject outside the immediate area of the student's dissertation research. Ph.D. candidates must have at least one (1) first-author paper published or accepted for publication in a peer review journal prior to graduation. The Ph.D. is awarded upon the completion of the above requirements and a research program that results in a dissertation of publishable quality with an oral defense. Completion of the degree usually requires 4 to 5 years.

M.D./Ph.D. Degree. Students enrolled in or accepted into the College of Medicine can apply to the Cellular and Integrative Physiology Graduate Program to work toward the combined M.D./Ph.D. degrees. Applications are reviewed by the Cellular and Integrative Physiology Graduate Committee separate from the College of Medicine application procedures. Admission into this combined degree program requires approval by the Dean for Graduate Studies and the Dean of the College of Medicine. The Department of Cellular and Integrative Physiology will work actively with the student to develop a schedule that will make most effective use of his/her time while studying for the combined degrees. The student should plan to spend a considerable block of time (generally 1-2 years) working exclusively on dissertation research in order to complete the graduate program.

Financial Aid. Full-time Ph.D. students in Cellular and Integrative Physiology generally receive tuition waivers and a research assistant stipend to cover living expenses and health insurance. Continuation of support depends on satisfactory progress in the program and availability of funds. Students who successfully complete for extramural fellowship support are awarded stipend bonuses. M.S. students are ineligible for stipend support.

Cellular and Integrative Physiology (PHYS)

*806 GRADUATE PHYSIOLOGY, 6 cr I. Introduction to the processes that regulate the activity of individual cells and organ systems. Lectures cover cell, neural, musculoskeletal system, cardiovascular, renal, respiratory, gastrointestinal, endocrine and reproductive physiology. Prereq: Permission of instructor.

814 SCIENTIFIC WRITING, 2 cr II. This course prepares students for writing grant proposals, manuscripts of scientific papers and other types of scientific writing. Computer lab offers additional practice plus opportunity to criticize each other’s work. Prereq: Permission of instructor.

896 RESEARCH OTHER THAN THESIS, 1-9 cr. By arrangement.

902 SPECIAL TOPICS, 1-4 cr — max 8. Prereq: Permission of Instructor.

914 REPRODUCTIVE ENDOCRINOLEGY, 2 cr I even yrs. Cellular and molecular mechanism(s) underlying the endocrine regulation of selected areas in the female reproductive system. Prereq: PHYS 806 (or equivalent) and permission of instructor.

916 CARDIOPULMONARY FUNCTION IN HEALTH & DISEASE, 2 cr I odd yrs. A lecture/discussion-based course concerned with current advances in the pathophysiology of cardiovascular and pulmonary diseases such as heart failure, hypertension and other conditions. Prereq: PHYS 806 (or equivalent) and permission of instructor.
920 ION CHANNELS AND DISEASE, 2 cr II odd yrs. Biophysical mechanisms underlying diseases linked to abnormalities of ion channel function. Course includes presentations by visiting faculty who are experts in the area. Prereq: PHYS 806 (or equivalent) and permission of instructor.

930 PHYSIOLOGY & PATHOPHYSIOLOGY OF THE KIDNEY, 2 cr II even yrs. Integrative, cellular and molecular mechanisms of renal function, with emphasis on the alterations accompanying renal disease. Prereq: PHYS 806 (or equivalent) and permission of instructor.

970 SEMINAR, 1 cr.

899 MASTER'S THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Genetics, Cell Biology and Anatomy

Graduate committee: Professors Joshi (Chair), Shull, Wheelock; Assistant Professors Gould, van Waes.

Objective. The graduate program in the Department of Genetics, Cell Biology and Anatomy is designed for qualified students who wish to pursue research and teaching careers in the broadly defined area of cell biology and related areas, and/or to obtain a firm foundation for teaching anatomical sciences. Genetics, Cell Biology and Anatomy participates in the integrated Biomedical Research Training Program (BRTP). The program leads to the Ph.D. degree.

Requirements for admission. To be eligible for graduate admission in the Department of Genetics, Cell Biology and Anatomy a student must meet the requirements of the Graduate College and must present an academic record and background which is acceptable to the Graduate Committee of the Department. Students are selected for admission on the basis of composite science and math grade point in addition to overall undergraduate grade point. The Graduate Record Examination is required of all applicants. Foreign applicants must submit TOEFL scores. Although we would like all the applicants to take the new GRE format including writing skills, we will consider applicants who have taken the old format GRE not more than two years from the date of application.

All students in the program are required to take the BRTP core courses "Macromolecular Structure and Function", "The Cell and Gene Regulation", "Molecular Cell Biology", and "Cell Signaling", and CBA 806 "Teaching and Research Presentation Skills". In addition, each student is required to take either "Human Gross Anatomy I and II", or "Human Neuroanatomy" or "Human Histology" which are offered during the summer terms; each of these courses has an associated teaching requirement. These traditional anatomy courses are taught on an independent study basis with regular meetings between students and supervising faculty members. Teaching requirements can be met by either assisting in a laboratory the following year or in the appropriate core in the medical student curriculum.

In addition to the course work, each beginning student will be expected to carry out a research rotation in three different faculty laboratories during his/her first year, spending a period of 2 months in each laboratory. Laboratories for each student will be selected by the chair of the graduate program, based upon the interest and background of the student. Following this rotation, the student will select his/her research mentor.

All students are required to enroll in Genetics, Cell Biology and Anatomy Seminar on a pass/fail basis. During their residence in the Department, all students will be required to present at least one seminar to the Department prior to admission to candidacy. Normally this seminar will be presented near the end of the second year of the program.

Any additional course requirements will be defined on an individual basis by the student's Supervisory Committee.

A comprehensive examination is required for admission to candidacy. The topic of this examination will be defined by the student's Supervisory Committee. The format of the examination will be either a grant proposal in the NIH format or development of teaching aid (including computer-based teaching). If a paper is chosen as the format it should be modeled after a current journal such as "Current Topics in Developmental Biology", "Modern Trends in Neurosciences" or "Annual Review of Cell Biology". Either form of examination will include both a written document and an oral defense.

A dissertation based on original research in the candidate's chosen field of study is required. The dissertation proposal should be submitted to the Supervisory Committee in the format of a grant
proposal for external funding. The candidate must successfully defend his/her dissertation in an oral examination.

The program is designed specifically to prepare students to obtain the M.S. or Ph.D. degree. The opportunity to study toward both the M.D. and Ph.D. degrees is available to select students who are accepted in the College of Medicine.

Research within the Department encompasses the broad areas of genetics, cell and developmental biology, transplantation biology, cancer biology, cardiovascular biology, neuroscience, and innovative teaching technologies. Specific research projects focus on topics such as identification of genetic determinants of cancer susceptibility; the role of homocysteine in heart disease and stroke and in selected birth defects; functional genomics of leukemia/lymphoma cells; cellular immunotherapy for leukemia/lymphoma; neuronal differentiation and migration; developmental abnormalities of the heart, neural tube and craniofacies; adult stem cell biology; and regulation of gene expression during embryogenesis; estrogen signaling in tumorigenesis and autoimmunity; transcriptional control of lymphocyte development; molecular genetics of retina development and function; molecular mechanisms of neurogenetic disorders. Excellent access is available to the UNMC Functional Genomics and Murine Genome Engineering core facilities.

Genetics, Cell Biology and Anatomy (CBA)

806 TEACHING AND RESEARCH PRESENTATION SKILLS, 2 cr. An introduction to fundamental concepts in developing effective teaching and research presentation skills.

*812 HUMAN NEUROANATOMY, 2 cr S. A study of the neuronal organization of the nervous system and the way interneuronal relationships explain the function of the sensory and motor systems. Medical aspects of the structure and function are demonstrated from clinical case material. Prereq: Permission of instructor.

826 HUMAN HISTOLOGY, 4 cr S. A study of cells, fundamental tissues and organ systems at both the light and ultramicroscopic level. Prereq: Permission of instructor.

830 FUNDAMENTALS OF ELECTRON MICROSCOPY, 2 cr II. Instruction in the general theory and techniques of electron microscopy, including special methods involved in the fixation, embedding, sectioning, and staining of specimens. Prereq: CBA 826 and permission of instructor.

832 FUNDAMENTALS OF CELL AND TISSUE CULTURE, 2 cr (Peds 832). Instruction in the methods and applications of in vitro cell and tissue culture. Lect. 1, lab 1. Prereq: CBA 826 and permission of instructor.

896 RESEARCH OTHER THAN THESIS, 1-6 cr.

902 SPECIAL TOPICS IN ANATOMY, 1-2 cr per s — max 8, I, II, S. Current problems, techniques, and literature pertaining to the major subdivisions of the field of anatomy. The student may participate in selected research topics, under the supervision of a selected instructor. Prereq: Permission of instructor.

910 HUMAN GROSS ANATOMY I, 5 cr S. A study of the human body (upper limb, head, neck, and thorax) by means of gross dissection, cross section, lecture, demonstration, radiographs and scans. Readings in and oral reports from anatomic literature introduce students to research topics. Prereq: Permission of instructor.

918 DEVELOPMENTAL BIOLOGY I, 3 cr I. An examination of the major areas of development, using current literature addressing well defined topics. The first semester covers oogenesis, fertilization, cleavage, establishment of the body axis, gastrulation, neurulation and morphogenesis. Prereq: Permission of instructor.
920 HUMAN GROSS ANATOMY II, 3 cr S. A continuation of 910 covering the abdomen, pelvis, and lower limb. Prereq: CBA 910 and permission of instructor.

922 NEUROBIOLOGY I, 3 cr, I (PHAR 922). The course consists of presentation of current literature addressing the classical topics of neuroembryology, neurohistology, neuroanatomy, neuropathology, neurophysiology, neuropharmacology and neuropathology. Prereq: Permission of instructor.

924 SELECTED PROBLEMS IN ELECTRON MICROSCOPY, 1-2 cr I, II, S. Problems will be selected involving the ultrastructure of cells, inter-relationships between cells and the characteristics of intercellular substances. Emphasis will be on operation and use of the electron microscope. Prereq: CBA 830 and permission of instructor.

928 DEVELOPMENTAL BIOLOGY II, 3 cr II. A continuation of 918 with an emphasis on the molecular basis for the determination of cell fate and the generation of cell diversity. Prereq: CBA 918.

932 NEUROBIOLOGY II, 3 cr II. A continuation of selected topics from 922 with an emphasis on the molecular biology of the neuron and the function of the central nervous system. Current topics will vary every year. Prereq: CBA 922 and permission of instructor.

TEACHING ANATOMY (credit as listed below). A series of courses designed to provide an opportunity for students to develop and apply the skills requisite for effective teaching in the anatomical sciences. Prereq: Appropriate CBA course(s) or equivalent, CBA 806 and permission of instructor.

940 TEACHING PRACTICUM: HUMAN GROSS ANATOMY I, 1-2 cr I, S.

942 TEACHING PRACTICUM: HUMAN NEUROANATOMY, 1 cr II, S.

949 TEACHING PRACTICUM: HUMAN HISTOLOGY, 2 cr I, S.

970 SEMINAR, 1 cr per s I, II. Prereq: Permission of instructor.

899 MASTER'S THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Medical Sciences Interdepartmental Area

Departments cooperating: Family Medicine; Genetics, Cell Biology and Anatomy; Health Informatics; Internal Medicine; Obstetrics and Gynecology; Oral Biology; Orthopaedic Surgery; Pediatrics; Pharmacology and Experimental Neuroscience; Physical Therapy Education; Preventive and Societal Medicine; Psychiatry; Radiology; and Surgery.

Graduate committee:

Co-Chairs:
M. Patricia Leuschen, Ph.D.  Genetics, Cell Biology & Anatomy, COM
David Shaw, Ph.D.  Oral Biology, COD

Members:
Jialin Zheng, Ph.D.  Pharmacology & Experimental Neuroscience
Gregory Karst, PT, Ph.D  Physical Therapy Education
Jim Medder, MD, MPH  Family Medicine
Cheryl Bagley Thompson, PhD, RN  Health Informatics
Carol Casey, Ph.D.  Internal Medicine
John S. Davis, Ph.D.  Obstetrics and Gynecology
Hani Haider, Ph.D.  Orthopedics
Joseph H. Evans, Ph.D.  Pediatrics
Andrew Jametan, Ph.D.  Preventive and Societal Medicine
William J. Burke, M.D  Psychiatry
Michael D. Boska, PhD  Radiology
Irakis Pipinos, M.D.  Surgery

The Medical Sciences Interdepartmental Area is intended for those who wish to pursue individually designed programs of an interdisciplinary nature within the medical sciences leading to the Master of Science and/or the Doctor of Philosophy degree. For example, individual programs of study may be developed in the following research areas: immunology, drug metabolism, human genetics, neurological sciences, oral biology, health services research, and others.

Admission to the Medical Sciences Interdepartmental Area (MSIA) Graduate Program. In addition to the general requirements governing admission to the Graduate College the following requirements must also be met: The Graduate Record Examination (GRE) is required. Individuals who have completed the Dental Admissions Test (DAT), the Medical College Admission Test (MCAT), or the Veterinary Aptitude Test (VAT) may substitute these tests for the GRE. Scores on the GRE, DAT, MCAT, and VAT serve only as general guidelines for admission.

Course requirements for the M.S. degree. The Master of Science degree in the Medical Sciences Interdepartmental Area may be earned only under Option One.

Course requirements for the Ph.D. degree. Please see the document entitled "Procedures Governing the Admission and Progress of Students in the Medical Sciences Interdepartmental Area Graduate Program."

Medical Sciences (MSIA)

899 MASTER'S THESIS

999 DOCTORAL DISSERTATION

• Family Medicine (FMED)

807 QUALITATIVE RESEARCH IN PRIMARY CARE, 2 cr. This course is designed to provide an understanding of the principles and methods of qualitative research as applied to the primary care setting. Topics covered include: types of research questions appropriate for qualitative research; qualitative study designs, sampling strategies; data collection and
measurement; data analysis; writing up qualitative research results for publication. Prereq: permission of instructor.

808 QUANTITATIVE RESEARCH IN PRIMARY CARE, 2 cr. This course is designed to provide an introduction to the principles and methods of quantitative research as applied to the primary care setting. Topics covered include: developing effective research questions; literature review, study design; sampling, data measurement and collection; analysis. Prereq: permission of instructor.

991 PRACTICUM IN ACADEMIC MEDICINE: MEDICAL STUDENT TEACHING, 1, 3 cr. This course consists of in-depth study and practical, hands on, supervised learning experiences in academic medicine with an emphasis on medical student education. Prereq: permission of instructor.

992 PRACTICUM IN ACADEMIC MEDICINE: RESIDENT PHYSICIAN TEACHING, 1, 3 cr. This course consists of in-depth study and practical, hands on, supervised learning experiences in academic medicine with an emphasis on resident physician education. Prereq: permission of instructor.

- Genetics, Cell Biology and Anatomy

  In addition to participating in the Medical Sciences Interdepartmental Area graduate program, Genetics, Cell Biology and Anatomy has an independent program leading to the M.S. and Ph.D. degrees.

  Click here for a listing of courses offered by Genetics, Cell Biology and Anatomy.

- Health Informatics

  The Department of Health Informatics participates in the Medical Sciences Interdepartmental Area Graduate Program, but does not offer any graduate courses.

- Internal Medicine (IMED)

810 DEVELOPING CLINICAL RESEARCH, 2 cr., I/II. Details the writing of a grant, IRB submission, consent forms, ethics of clinical research, using a database and presenting the information. Beginning statistical terminology and methods. Course spans 2 semesters beginning in Fall Semester.

840 CLINICAL SYSTEMS ARCHITECTURE AND FUNCTION (UNO-ISQA 8400), 3 cr. This course serves to integrate multiple topics into an understanding of clinical health care information system history, architectures, and design. The needs of multiple disciplines will be explored to understand how they can share, communicate and manage patient information using clinical information standards. Prereq: permission of instructor.

937 DIABETES MELLITUS, 1 cr per s — max 2. Selected topics of interest in diabetes mellitus. The emphasis is investigational. The laboratory emphasis must relate to studies under way in the Division.

972 MEDICAL SEMINAR, 1 cr.

- Obstetrics and Gynecology (OGBY)

  The Department of Obstetrics and Gynecology participates in the Medical Sciences Interdepartmental Area Graduate Program, but does not offer any graduate courses.

- Oral Biology (OBIO)
**803 BIOSTATISTICS**, 3 cr I (odd yrs). An introductory course in the fundamental concepts of statistical inference for application to the planning and executing of scientific studies in biomedical research.

**818 HUMAN PHYSIOLOGY**, 5 cr II. A study of the physiology of cells and organ systems. Provides an in depth survey of cell membrane, neural, respiratory, cardiovascular, renal, gastrointestinal, and endocrine physiology. Topics are presented to provide a basis for understanding normal function in the human, with an emphasis on the oral cavity. Lect. 5. Prereq: Permission.

**831 DENTAL BIOMATERIALS**, 3 cr I. Understanding of materials science principles and relation to clinical practice, including stress-strain, mechanical and physical properties, gypsum, elastomers, polymers, metals, ceramics, cements, and biocompatibility. Prereq: Permission of Instructor.

**840/841 CRANIOFACIAL GROWTH AND DEVELOPMENT I/II**, 1 cr each I/II. A lecture and seminar study of prenatal and postnatal growth and development of the head with special emphasis on osteology, prenatal and postnatal factors influencing growth, and clinical management of craniofacial growth disorders. Prereq: Permission.

**848 LIGHT AND ELECTRON MICROSCOPY METHODS**, 2 cr, S. Lectures and laboratory with individual participation in light and electron microscopy techniques including hard and soft tissues. Lect/Lab. Prereq: Permission.

**849/850 BIOPHYSICAL PRINCIPLES I/II**, 1 cr each I/II. The study of the construction, application, and operations of orthodontic appliances with special consideration given to the physiological reaction of oral and dental tissues to the forces involved. Prereq: Permission.

**851 ADVANCED DENTAL BIOMATERIALS**, 3 cr II (even years). Advanced topics in biomaterials science and their application to clinical dentistry and dental specialty practice. Topics include Hooke’s Law, viscoelasticity, structure-property relationships of biological materials, failure and strengthening mechanisms of metals, ceramics, polymers, composites and elastomers. Prereq: OBIO 831 or equivalent or permission of instructor.

**855 ADVANCED ORAL BIOLOGY**, 3 cr I. A didactic study of the development, molecular and cell biology, histology and physiology of orofacial structures. Oral microbial ecology and resultant diseases, dental asepsis and OSHA are also discussed. Lect. 3. Prereq: Permission.

**860 ADVANCED ANATOMY**, 2 cr I. Studies of general and special gross anatomy, embryology and neuroanatomy of the human body with emphasis on the head and neck. Lect/Lab as arranged. Prereq: Permission.

**862 ADVANCED DENTAL PHARMACOLOGY**, 1 cr II (odd yrs). A didactic study of the pharmacological principles of drug action at the cellular and organ levels. Emphasis is placed on drugs utilized in dentistry. Lect 1. Prereq: Permission.

**866 IMMUNOLOGY AND MICROBIOLOGY OF ORAL INFECTIOUS DISEASE**, 3 cr I. A study of the immune system, secretory immunology, immunopathology, and resistance mechanisms of the human body. Pathogenic microbes related to oral diseases and dental asepsis, their pathogenesis and epidemiology are discussed. Lect. 3. Prereq: Permission.

**867 PROJECT PLANNING AND DESIGN**, 1 cr S. Discussion of types of research, research writing techniques and procedures, designing a research project, and the accurate reporting of the design and results of original research.
870/871 ADVANCED PERIODONTOLOGY I/II, 2 cr each I/II. The study of etiology, diagnosis, and treatment of periodontal diseases. Prereq: Permission.

895 ADVANCED ORAL PATHOLOGY, 2 cr I. Common oral lesions resulting from developmental, inflammatory, metabolic and neoplastic changes. Lect. 2. Prereq: Permission of instructor.

970 SEMINAR, 1 cr II. Student-led discussions of their own research and/or analysis of recent publications in the biomedical sciences.

992 SPECIAL TOPICS, 1-3 cr.

- Orthopaedic Surgery (ORTH)

  The Department of Orthopaedic Surgery participates in the Medical Sciences Interdepartmental Area Graduate Program but does not offer any graduate courses.

- Pediatrics (PEDS)

  832 FUNDAMENTALS OF CELL AND TISSUE CULTURE, 2 cr S. (CBA 832). See CBA 832 for course description.

  896 RESEARCH IN PEDIATRICS, cr arr.

  911 HUMAN GENETICS AND CYTOGENETICS PRINCIPLES, 2 cr. Human genetics principles, etiologies of disease, genetic syndromes, counseling issues, population genetics and ethical considerations in genetics. Prereq: Permission of instructor.

  912 HUMAN CYTOGENETICS LABORATORY, 2 cr. Development of research tools in human genetics. Includes culture of peripheral blood and human chromosome methodology, analysis and identification. Prereq: PEDS 911 or concurrent enrollment.

  913 ADVANCED GENERAL PEDIATRICS, 3-11 cr. In depth study in any of the pediatric subspecialties, this course may include lectures, conferences, readings, or research. Prereq: permission of instructor.

- Pharmacology and Experimental Neuroscience

  In addition to participating in the Medical Sciences Interdepartmental Area graduate program, Pharmacology & Experimental Neuroscience has an independent program leading to the M.S. and Ph.D. degrees.

  Click here for a list of courses offered by Pharmacology & Experimental Neuroscience.

- Physical Therapy Education (PHYT)

  942 SPECIAL TOPICS, 1-6 cr.

  943 LABORATORY PRACTICUM, 2-6 cr. Students devise and execute a research project with emphasis on developing proficiency in data collection and data analysis pertinent to the study of motor control or physical activity. Prereq: permission of instructor.

- Preventive and Societal Medicine (P-SM)
**806 BIOSTATISTICS I**, 3 cr I. This course is designed to prepare the graduate student to understand and apply biostatistical methods needed in the design and analysis of biomedical and public health investigations. The major topics to be covered include types of data, descriptive statistics, theoretical distributions, probability, estimation, hypothesis testing, and one-way analysis of variance. A brief introduction to correlation and univariate linear regression will also be given. The course is intended for graduate students and health professionals interested in the design and analysis of biomedical or public health studies. Prereq: graduate standing, degree-seeking students.

**808 BIOSTATISTICS II**, 3 cr II. This course is designed to prepare the student to understand and apply advanced biostatistical methods needed in the design and analysis of biomedical investigations. The major topics to be covered include multiple linear regression, analysis of covariance, logistic regression, survival analysis, and repeated measures analysis. The statistical software package SPSS will be used for all analyses. Prereq: P-SM 806 or permission of instructor.

**810 The U.S. Health Care System: An Overview**, 3 cr (UNO-PA 8760). This course will offer the student an overview of the health and medical care delivery system in the U.S. Topics covered from a historical, economic, sociological, and policy perspective include the following: social values in health care; need, use, and demand for services; providers of health services (people and places); public and private payment systems; alternative delivery systems; and models from other countries. Current health care reform proposals will also be addressed. Prereq: graduate standing.

**815 HISTORY AND PHILOSOPHY OF PUBLIC HEALTH**, 3 cr. This course examines historical and philosophical themes in public health. Topics include the nature and value of health; explanations of disease; conflicts among individuals, society, and the environment; the roles of government, communities, and health professionals; interpretations of health disparities; concepts of risk; and old and new conceptions of public health.

**820 EPIDEMIOLOGY THEORY AND APPLICATION**, 3 cr I. The objective of the course is to understand the application of survey and research methodology in epidemiology, especially in the community setting. Theoretical aspects will be taught as an integral part of understanding the techniques of study design and community survey. Concepts to be covered include measures of disease occurrence, measures of disease risk, study design, assessment of alternative explanations for data-based findings and methods of testing or limiting alternatives. Students will be expected to address an epidemiologic question of interest to them, first developing the hypothesis, doing a literature search, then developing a study design and writing, in several stages, a brief proposal for the study.

**821 EPIDEMIOLOGY: ADVANCED DESIGN & METHODS**, 3 cr II. This course presents basic principles and methods of epidemiology in greater depth and detail than presented in P-SM 820. The purpose of the course is to further develop the methodological concepts underlying the science of epidemiology. The material covered is intended to broaden and extend the student's understanding of elements of study design, data analysis, and causal inference in epidemiologic research including specific emphasis on bias and confounding and is anticipated to serve as a foundation for advanced study of epidemiologic methods. The primary goal of this course is to provide working knowledge of the fundamentals of epidemiology to graduate students who wish to further their career in public health research and have the need more expertise in advanced epidemiologic methods, with the objective of applying these concepts to a broader public health context. Prereq: P-SM 820 or equivalent and P-SM 806 or equivalent; OR permission of instructor.

**825 HEALTH CARE ETHICS**, 3 cr II (biennial). This course uses selected topics to outline the history, theory, and methods of health care ethics. It is intended as a core course for graduate students in ethics and related fields, bioethics teachers, administrators, policy-makers, clinicians, and health care professions students.
860 HEALTH ECONOMICS (UNO-ECON 8600), 3 cr II. This course is designed to help students understand how the theories and models of economics can be applied to the study of health and health care. The examination of the markets (demand and supply) for health, health care and health insurance is stressed. In addition, the economic analytic tools such as microeconomic theories and economic evaluation methods will also be reviewed and introduced. The objective of this course is to equip students with the knowledge/tools to examine and analyze the problems/issues of health care from the perspective of economics. Prereq: UNO-ECON 2200 (Principles of Economics) or equivalent.

892 PUBLIC HEALTH, ENVIRONMENT & SOCIETY, 3 cr. The purpose of this course is to introduce the students to environmental factors including biological, physical and chemical factors which affect the health of a community. The main focus of the course will be the effects of exposures that have been associated with human health and environmental problems in the Midwest, specifically water and air pollutants related to animal feeding operations, arsenic in ground water, pesticides, herbicides, lead and radiation. The effects of global warming, ergonomic problems in the meat packing industry and occupational and environmental problems in health care will also be discussed. Prereq: college level course in biology or chemistry, or permission of instructor.

896 RESEARCH OTHER THAN THESIS, 1-6 cr. Prereq: graduate standing.

970 SEMINAR, 1 cr. Prereq: permission of instructor.

998 SPECIAL TOPICS, 1-3 cr. Independent study course focusing on selected topics or problems. The subject will be dependent on student demand and availability of staff.

- Psychiatry (PSYC)

  The Department of Psychiatry participates in the Medical Sciences Interdepartmental Area Graduate Program, but does not offer any graduate courses.

- Radiology (RADI)

  The Department of Radiology participates in the Medical Sciences Interdepartmental Area Graduate Program, but does not offer any graduate course.

- Surgery (SURG)

850 READINGS IN CLINICAL INFORMATICS (UNO-ISQA 8500), 3 cr. Overview of topics in clinical information systems (CIS) with readings covering history of clinical computing, the current regulatory environment, structure of CIS and the electronic health record. Purpose is to provide integrative knowledge of theory and applications in clinical informatics. Students will complete assigned readings and participate in discussions. Prereq: graduate standing in health information sciences or informatics concentration in ISQA masters program; permission of instructor.
Programs and courses

Nursing

Graduate committee: Associate Professor McCabe (Chair); Professor Tilden; Associate Professors Barron, Miya, Pozehl, Twiss, Waltman, Wilson; Assistant Professor Cramer and Nieveen.

The College of Nursing offers a program leading to the degrees of Master of Science in Nursing and the Doctor of Philosophy.

Graduate level nursing courses are offered by the Graduate Faculty at the College of Nursing. Graduate level cognate courses in the basic, behavioral and social sciences may be taken at the University of Nebraska at Omaha, Lincoln, Kearney, or the Medical Center, or from any other accredited graduate program. All programs of study are planned with the major adviser after acceptance into the graduate program.

MASTER’S PROGRAM: Purpose, outcomes, and competencies.
The purpose of the master's program in nursing is to prepare nurses for advanced practice as nurse practitioners, clinical nurse specialists, nurse administrators, or informatics nurse specialists. The master's program in nursing is dedicated to meeting the advanced practice nursing needs of the citizens of Nebraska and the region through excellence in graduate education. The College of Nursing is committed to preparing advanced practice nurse leaders who are recognized for their scholarship, practice, and professional standards. The outcomes and competencies presented here are representative of the core competencies of graduates. Specialty specific expectations may be found in other documents.

Outcome I. Advanced practice nurses work collaboratively within the health care system to promote client health and improve client outcomes.

Competencies. The advanced practice nurse:
1. Uses knowledge, theories, models, and research from nursing and related disciplines in the practice of advanced nursing.
2. Evaluates, uses, and/or develops data, information, and knowledge resources for use in delivery, and/or coordination of care for individuals, families, groups and communities.
3. Uses advanced assessment, diagnostic, intervention, and evaluation skills for complex client health problems and health system issues.
4. Integrates principles of ethics, interpersonal processes, cultural diversity, and respect for human beings into their advanced practice.
5. Analyzes consumer health care needs through examination of interrelationships of demographics, major social health care problems, regulatory requirements, and economic health care policies.

Outcome II. Advanced practice nurses are leaders for the discipline and are responsive to current and emerging issues facing nursing and health care.

Competencies. The advanced practice nurse:
1. Serves as a leader to facilitate improvement in client outcomes in the health care system.
2. Values personal integrity and growth in self and others as an essential element in effective leadership within professional nursing organizations and the health care system.
3. Analyzes changes in the health care system to determine the impact on nurses in advanced practice.
4. Builds networks and effectively communicates (written and oral) with the interdisciplinary health care team, professional colleagues, community leaders, and policy makers.
5. Supports quality health care by adhering to professional standards and leading by example.
6. Applies knowledge from economics and business to understand how health care is financed and organized nationally, state wide, and locally.
7. Understands the health care policy development process and how it influences the health system and nursing practice.

**Outcome III.** Advanced practice nurses apply the research process to collaborate with experienced investigators in advancing nursing knowledge and in addressing nursing practice and health system problems.

**Competencies.** The advanced practice nurse:
1. Collaborates with experienced investigators in implementing research.
2. Analyzes the clinical and health system relevance of research findings and integrates them into advanced practice.
3. Reads research critically and synthesizes research and practice evidence.
4. Uses electronic and emerging technology to access, process, and disseminate information.
5. Values scholarship and the research process as key elements of advanced practice.

The Nursing master's graduate program offers several programs of study: Adult Health and Illness Nursing combined Clinical Nurse Specialist/Nurse Practitioner roles (subspecialities in acute care, oncology and ambulatory care); Primary Care/Family Nurse Practitioner; Family Nurse Practitioner/Psychiatric Mental Health Advanced Practice Nursing; Gerontological Nursing (focus areas in Advanced Gerontological Nursing, Gerontological Nurse Practitioner and Advanced Geropsychiatric Nursing); Health Systems Nurse Specialist (focus areas in community health, nursing administration and nursing informatics); Psychiatric Mental Health Nursing; Women's and Children's Health Advanced Practice Nursing (combined Clinical Nurse Specialist/Nurse Practitioner roles in Women's and Children's Health subspecialities and Nurse Practitioner role in Neonatal Nursing subspeciality).

**Admission requirements.** Following receipt of the completed application from the Office of Academic Records and a complete set of transcripts from all educational institutions attended, the Nursing Graduate Committee will evaluate candidates by the following criteria:
- Baccalaureate Degree in Nursing from a program accredited by the CCNE or NLNAC.
- Cumulative grade point average of 3.0 (on a 4.0 scale) on all undergraduate work.
- Prior to admission to the Graduate Program, U.S. citizen applicants must hold Registered Nurse License in one of the fifty states. Foreign citizens not legally licensed to practice nursing in the U.S. shall provide evidence that they (1) have the equivalent of a baccalaureate degree in nursing and (2) are eligible to practice nursing in their country of residence. Prior to enrollment in clinical courses and to conduct research (896; 899) student must hold Registered Nurse Licensure in the particular state(s) in which participating in clinical practice and research activities.
- Three letters of recommendation: one from the dean, administrator, or faculty member of the college from which the student was graduated and two from nursing employers.
- Personal interview with a Graduate Faculty Member in the area of concentration to which the student has applied.
- Biographical sketch including a description of the applicant's goals relative to his/her professional career.
- A course in health assessment or its equivalent.
- An undergraduate research course.

Physically challenged persons will be evaluated on an individual basis using "Technical Standards for the Graduate Nursing Program."

**Admission to candidacy.** To be admitted to candidacy the student should have full graduate status, have no admission deficiencies, and should have demonstrated satisfactory performance in graduate courses. Such courses must include one clinical nursing course and the research methods course (805).

**Program of study.** The program leading to a M.S.N. requires satisfactory completion of a core of graduate courses (NRSG 801, 804, 805, a graduate statistics course and NRSG 896 or 899) as well as clinical and support courses specified for the chosen area of concentration and support area.
Participation in departmental seminars is also required. A program of study for each area of concentration can be found below.

**Curriculum requirements for the degree**  
**of Master of Science in Nursing**

All M.S.N. students are required to complete the following courses:

NRSG 801-Knowledge Development in Nursing (3 cr.);  
NRSG 804-Adv. Nursing in the Health Care Delivery System (3 cr.)  
NRSG 805-Research Methods for Advanced Nursing Practice (3 cr.);  
NRSG 896-Research in Clinical Nursing (total of 5 credits) or NRSG 899-Masters Thesis (total of 6 credits)  
Graduate Statistics (3 cr.)

In addition, the following courses are required in the student's selected specialty area:

**A. Adult Health & Illness**

**Specialty Core Course**

883 Applied Pharmacology for Advanced Practice Nurses (3 cr)  
818 Pathophysiology for Advanced Practice Nurses I (3 cr)  
819 Pathophysiology for Advanced Practice Nurses II (1 cr)  
810 The Role of the APN in Adult Health & Illness (1 cr)  
811 Advanced Adult Health & Risk Management (5 cr)  
812 Management of Adult Clients with Health Problems (6 cr)  
814 Management of Adult Clients with Health Problems II (6 cr)  
808 Outcome Management for the Health Care Professional (2 cr)

**Subspecialties: (select one area)**

#1: **Acute Care**  
813 Advanced Practice Nursing in Acute Care (6 cr)

#2: **Oncology**  
814 Management of Adult Clients with Health Problems II (6 cr)

#3: **Ambulatory Care**  
807 Advanced Practice Nursing in Ambulatory Care (6 cr)

**B. Women's and Children's Health**

**Specialty Core Courses**

803 Advanced Concepts Related to Women & Children (2 cr)  
818 Pathophysiology for Advanced Practice Nurses I (3 cr) OR 818 (2 cr) and 819 Pathophysiology for Advanced Practice Nurses (1 cr)  
839* Advanced Women & Children Health Nursing Practicum (1-6 cr)  
Nursing elective for Women's and Children's subspecialties

**Subspecialties: (select one area)**

#1: **Women's Health Nursing**  
833 Assessment in Women's Health Care (2-5 cr)  
835* Adv. Manage. of Pregnancy, Reproductive and Sexuality Issues (3-6 cr)  
837* Adv. Management of Maternal and Women's Chronic and Health Care Problems (2-5 cr)  
883 Applied Pharmacology for Advanced Practice Nurses (3 cr)

#2: **Children's Health Nursing**  
820 Adv. Assessment in Children's Health Care (3-6 cr)  
822* Primary Care of Children II: Acute Health Problems (2-5 cr)  
824* Primary Care of Children III: Chronic Health Problems (2-5 cr)  
883 Applied Pharmacology for Advanced Practice Nurses (3 cr)
#3: Neonatal Nurse Practitioner
818 Pathophysiology for Adv. Practice Nurses I (3 cr)
820 Adv. Assessment in Children's Health Care (1 cr)
833 Adv. Assessment in Women's Health Care (2 cr)
825 Neonatal Assessment (3 cr)
830 Neonatal Assessment and Diagnostic Practicum (3 cr)
831 Management of the High Risk Neonate (5 cr)
832 Care of High Risk Neonate (5 cr)
884 Pharmacotherapeutics for Neonatal Care (3 cr)
*Clinical Nurse Specialist courses - clinical hours in marked courses would be reduced to add:
821 Advanced Practice CNS Practicum I (3 cr)
823 Advanced Practice CNS Practicum II (3 cr)
829 Advanced Practice CNS Practicum III (5 cr)

C. Psychiatric/Mental Health Nursing \(^3\)

Specialty Core Courses\(^1\)
883 Applied Pharmacology for the Advanced Practice Nurses (3 cr)
867 Neuroscience Fundamentals for Advanced Practice Nursing (2 cr)
862 Counseling Models in Adv. Psychiatric Mental Health Nsg. (4 cr)
863 Adv. Psychiatric Mental Health Nursing with Adults (4 cr)
864 Adv. Psychiatric Mental Health with Children & Adolescents (4 cr)

Focus Area Courses: (select one area)
#1: Adv. Psychiatric Nursing Practice
868 Practicum in Advanced Psychiatric Mental Health Nursing (5 cr)
One cognate (3 cr)
#2: Adv. Geropsychiatric Nursing
851 Advanced Gerontological Nursing: Health Promotion (6 cr)
852 Advanced Gerontological Nursing: Health Problems (4 cr)
853 Advanced Gerontological Nursing in the Aging Network (3 cr)
856 Advanced Gerontological Nursing: Mental Health Assessment and Intervention (2 cr)
868 Practicum in Advanced Psychiatric Mental Health Nursing (4 cr)

D. Gerontological Nursing \(^4\)

Specialty Core Courses\(^1\)
851 Advanced Gerontological Nursing: Health Promotion (6 cr)
852 Advanced Gerontological Nursing: Health Problems (4 cr)
853 Advanced Gerontological Nursing in the Aging Network (3 cr)
883 Applied Pharmacology for the Advanced Practice Nurse (3 cr)

Focus Area Courses: (select one area)
#1: Adv. Gerontological Nursing Practice
855 Adv. Ger. Nursing: Mental Health Assessment and Intervention (3 cr)
854 Advanced Practicum in Gerontological Nursing (4 cr)
#2: Geriatric Nurse Practitioner
818 Pathophysiology for Advanced Practice Nursing I (3 cr)
855 Adv. Ger. Nursing: Mental Health Assessment and Intervention (3 cr)
854 Advanced Practicum in Gerontological Nursing (6 cr)
888 Primary Health Care of Older Families (6 cr)
#3: Adv. Geropsychiatric Nursing Practice
862 Counseling Models in Adv. Psychiatric Mental Health Nsg. (4 cr)
863 Adv. Psychiatric Mental Health Nursing with Adults (4 cr)
867 Neuroscience Foundation for Advanced Practice Nursing (2 cr)
856 Advanced Geropsychiatric Nursing (2 cr)
868 Practicum in Advanced Psychiatric Mental Health Nursing (4 cr)

E. Primary Care/Family Nurse Practitioner

Specialty Core Courses
818 Pathophysiology for Advanced Practice Nurses I (3 cr)
840 Community Based Care of Vulnerable People (2 cr)
882 Advanced Health Assessment (3 cr)
883 Applied Pharm. for Advanced Practice Nurses (3 cr)
885 Role Issues for the Advanced Practice Nurse (1 cr)
886 Advanced Health Promotion (3 cr)
887 Primary Health Care-Young Families (6 cr)
888 Primary Health Care-Older Families (6 cr)
889 Advanced Primary Health Care of Families (6 cr)

Subspecialty:
#1 Integrated Family Nurse Practitioner/Psychiatric Mental Health Role
862 Counseling Models in Advanced Psychiatric Mental Health Nursing (3 cr)
863 Advanced Psychiatric Mental Health Nursing with Adults (3 cr)
864 Advanced Psychiatric Mental Health with Children and Adolescents (4 cr)
867 Neuroscience Foundation for Advanced Practice Nursing (2 cr)
868 Practicum in Advanced Psychiatric Mental Health Nursing (3 cr)
869 Advanced Integrated Primary Health Care and Psychiatric Mental Health Nursing (5 cr)

F. Health Systems Nurse Specialist

Specialty Core Courses
841 Health Care Systems (3 cr)
842 Community & Organizational Development (3 cr)
844 Nursing Health & Culture in Organizations & Communities (3 cr)
871 Nursing Informatics in Health Systems (3 cr)
872 Health Care Economics & Financial Management (3 cr)

Subspecialties (select one area)
#1: Community Health
847 Community Assessment and Health Programming (4 cr)
848 Practicum in Managing and Evaluating Health of Populations (5 cr)
Graduate Epidemiology (3 cr)
#2: Nursing Administration
873 Developing Systems and Infrastructures In Health Care Organizations (5 cr)
874 Practicum in Managing and Evaluating Health Care Organizations (4 cr)
One Elective
#3: Nursing Informatics
875 Nursing Information Systems Analysis and Design (4 cr)
876 Practicum in Implementation, & Evaluation of Nursing Information Systems (5 cr)
877 Data Management for Nursing Practice (3 cr)

1 Students in this area complete the specialty core courses listed in addition to selecting and completing the courses in one subspecialty or focus area.

2 This program offers a synthesized nurse practitioner-clinical nurse specialized role in advanced practice nursing. Graduates from this area will be eligible to sit for professional certification as a nurse practitioner or clinical nurse specialist.

3 Upon completion of this program, students will have completed the course work necessary to take one of the following certification examinations: Nursing Informatics, Clinical Specialization In Community Health Nursing, Advanced Nursing Administration or Psychiatric Mental Health Nursing.
Graduates from this area will have completed the course work necessary to complete one of the following certification examinations: Gerontological Nurse Practitioner; Gerontological Clinical Nurse Specialist; or Geropsychiatric Nurse Practitioner.

Graduates from this area who complete the Specialty Core Courses will be eligible to sit for professional certification as a Family Nurse Practitioner (FNP). Graduates who complete the Specialty Core Courses and the Integrated FNP/PMH subspecialty can sit for the Psychiatric Mental Health Nursing certification exam in addition to the FNP exam.

DOCTORAL PROGRAM.

PURPOSE. The purpose of the doctoral program is to prepare beginning nurse scientists or nurse scientist/educators to enhance the health of human beings through the development, testing and dissemination of nursing knowledge. The doctoral program is committed to quality graduate education and to a learning environment which promotes development of personal, professional, leadership and scholarly dimensions.

OUTCOMES. The doctoral program prepares beginning nurse scientists who are recognized for their focused area of expertise and who receive this recognition based on:

A. Development and dissemination of knowledge:
   Competencies.
   1. Critically evaluates and synthesizes theoretical and research knowledge as it relates to a specific area of the practice of nursing.
   2. Generates and/or tests theories which guide practice.
   3. Develops and designs a program of research which will advance knowledge and practice in a specific area of expertise.
   4. Disseminates findings of research through publications and presentations to the scientific community as well as to interdisciplin ary health care providers, students, policy makers, and consumers.

B. Impact on the health of the population.
   Competencies.
   1. Develops scholarly communication skills to begin influencing other scholars, interdisciplinary health care teams, professional colleagues, community leaders, policy makers and health care environments.
   3. Participates in local and national groups or organizations that have a health care agenda related to area of expertise.

C. Contribution to the profession/discipline.
   Competencies.
   1. Participates in and provides leadership in professional organizations, health service systems, and other health related enterprises.
   2. Incorporates professional accountability (ethical, legal, political and economic) into role as professional nurse scientist.

Admission requirements: Following receipt of the completed application and a complete set of transcripts from all educational institutions attended, students will be selected from a pool of qualified applicants meeting the following requirements:

- Master’s degree in nursing from a program accredited by the CCNE or NLNAC. Students without a Master’s degree in Nursing may be accepted into the program. Necessary course work will be completed under the supervision of the adviser.
- Statement of educational and professional goals and area of research interest (typed, double-spaced and no longer than three pages).
- A current curriculum vitae.
- A minimum grade point average of 3.2 in the master’s program.
• Graduate Record Examination (GRE) scores. (A minimum combined verbal and quantitative score of 900 is required to be considered and interviewed.)
• Three letters of reference (preferably from persons holding a doctorate): two academic references, including one reference describing research ability from the program where the master’s degree was obtained, and one professional performance reference.
• Two examples of scholarly writing: A research project or thesis from the master’s program and a published research paper. If the paper is a co-authored publication, a statement detailing the percent of responsibility of the applicant’s work should be submitted.
• Interviews with the Associate Dean for Graduate Programs and at least one member of the doctoral subcommittee of the Graduate Committee.

Recommendations for admission are made in the spring (usually March).

**Program of study:** In addition to meeting Graduate College requirements for the Ph.D. degree, completion of NRSG 901, 902, 904, 907, 908, 920, 970, 998, and 999 are required. A minimum of 4 credits over 2 semesters is required for 970. A multivariate statistics course is required. In addition, at least 5 graduate-level cognates (exclusive of methods courses) are required to support the student’s area of research and career goals. A qualifying examination is taken after completion of 901, 902, 904, 907. Students must participate in departmental research seminars.

NRSG (NRSG) - Full course descriptions available in [College of Nursing Bulletin](#).

**801 KNOWLEDGE DEVELOPMENT IN NURSING,** 3 cr. Exploration of nursing science including description, analysis and evaluation of selected theories with application to nursing practice. Application of empirical, ethical, personal, esthetics, socio-political, and spiritual knowing to advanced nursing practice.

**803 ADVANCED CONCEPTS RELATED TO WOMEN AND CHILDREN,** 2 cr. Beginning socialization of students into the advanced nurse practice role. This course explores the advanced theoretical and research foundations of nursing of women and children, including neonates.

**804 ADVANCED NURSING IN THE HEALTH CARE DELIVERY SYSTEM,** 3 cr. Personal and professional development for advanced practice and leadership in nursing. Includes examination of diverse perspectives that form nursing, health care, and health care policy; envisioning future possibilities; using dialogue and critical thinking skills. Lect.

**805 RESEARCH METHODS FOR ADVANCED NURSING PRACTICE,** 3 cr. Engages the learner in critically examining the steps of the research process. Emphasizes developing knowledge and skills needed for writing a proposal for quality monitoring, project evaluation, research utilization, and/or clinical research. Lect. Prereq: Undergraduate course in research and a graduate statistics course prior or concurrent.

**807 ADVANCED PRACTICE NURSING IN CHRONIC CARE,** 2 or 6 cr. To apply knowledge and skills in advanced nursing practice nursing with adult clients experiencing chronic illness. Lect 2, clin/lab 0-4. Prereq: NRSG 808, 810, 811, 812, 814, 818, 883; OR permission of instructor.

**808 OUTCOME MANAGEMENT FOR THE HEALTH CARE PROFESSIONAL,** 2 cr. Measurement, management, and evaluation of health care outcomes in practice. Prereq: NRSG 805 and graduate statistics pre- or coreq; or permission of instructor.

**810 THE ROLE OF THE ADVANCED PRACTICE NURSE IN ADULT HEALTH AND ILLNESS,** 1cr. Orient students to the synthesized Clinical Nursing Specialist/Nurse Practitioner role in adult health and illness nursing. Prereq: Admission to the Graduate Program or permission of instructor.

**811 ADVANCED HEALTH ASSESSMENT AND HEALTH PROMOTION,** 4-5 cr. Increase the knowledge and expertise for the acquisition of advanced clinical skills used in assessing, promoting, and maintaining the health of adults. Lect 2, clin/lab 2-3. Prereq: NRSG 810, an undergraduate health assessment course within five years of admission to graduate program, or permission.
812 MANAGEMENT OF ADULT CLIENTS WITH HEALTH PROBLEMS I, 3-6 cr. Focuses on advanced practice nursing with adult clients experiencing acute and chronic alterations in selected body systems (e.g., integumentary, respiratory, musculoskeletal, immune, genitourinary, and gastrointestinal). Lect 3, clin/lab 0-3. Prereq: NRSG 818, 810 and 811 OR permission of instructor.

813 ADVANCED PRACTICE NURSING IN ACUTE CARE, 2 or 6 cr. Develop knowledge and competencies for advanced nursing practice with adults experiencing acute episodes of common chronic illnesses/problems. Lect 2, clin/lab 0 or 4. Prereq: NRSG 810, 811, 812, 814, 808, 818, 883 OR permission of instructor.

814 MANAGEMENT OF ADULT CLIENTS WITH HEALTH PROBLEMS II, 2-6 cr. Focuses on advanced practice nursing with adult clients experiencing acute and chronic alterations in selected body systems (e.g., musculoskeletal, cardiovascular, neurological, and cerebrovascular, and immune). Lect 2, clin/lab 0-4. Prereq: NRSG 818, 810, 811, 812 OR permission of instructor.

815 ADVANCED PRACTICE NURSING IN ONCOLOGY, 2 cr. Develop in depth knowledge and skills for advanced nursing practice within the context of cancer care. Lect 2. Prereq: NRSG 818, 810, 811, 812, 814 OR permission of instructor.

816 PRACTICUM IN ADVANCED PRACTICE NURSING IN ONCOLOGY, 1-4 cr. To apply knowledge and skills in advanced nursing practice with adult clients experiencing cancer. Lab 1-4. Prereq: NRSG 810, 811, 812, 814. Pre- or coreq: NRSG 819, 833, 815; or permission of instructor.

818 PATHOPHYSIOLOGY FOR ADVANCED PRACTICE NURSES I, 1-3 cr. An integrated study of the pathophysiology of disorders seen in primary care settings. Lect/disc 1-3. Prereq: Course in undergrad physiology or permission of instructor.

819 PATHOPHYSIOLOGY FOR ADVANCED PRACTICE NURSES II, 1-3 cr. An integrated study of the pathophysiology of disorders seen in primary care settings. Continuation of NRSG 818. Lect/disc 1-3 cr. Prereq: NRSG 818 or permission of instructor.

820 ADVANCED ASSESSMENT IN CHILDREN'S HEALTH CARE, 1 or 3-6 cr. Knowledge and skill in diagnostic reasoning for assessing, promoting, and maintaining health of children within the family context. Lect/sem 1 or 3, lab 0-3. Prereq: Undergraduate health assessment course, Pre- or coreq: Nrsrg 803, 883, or permission of instructor.

821 ADVANCED PRACTICE CNS CLINICAL PRACTICUM I, 3 cr. This clinical course will provide preceptored practicum to begin to explore the advanced practice clinical nurse specialist (CNS) roles of clinician, clinical care manager, researcher, health educator, and consultant. Opportunities for implementation of advanced practice skills related to the areas of women's, neonatal and children's health will be provided. Prereq: NRSG 803, NRSG 820 or NRSG 833 or NRSG 884, permission of instructor.

822 PRIMARY CARE OF CHILDREN II: ACUTE HEALTH PROBLEMS, 2-5 cr. Management of selected acute care problems of children within the context of their families. Lect/sem 2, lab 0-3. Prereq: NRSG 820; Pre- or coreq: 818, or permission of instructor.

823 ADVANCED PRACTICE CNS CLINICAL PRACTICUM II, 3 cr. This clinical course focuses on the implementation of principles of evidenced based practices delivered by advanced practice clinical nurse specialists (CNS) in the delivery of quality care services in the areas of women's, neonatal or children's health care. Clinical practice will allow for the implementation of health care projects. Prereq: NRSG 821 or permission of instructor.

824 PRIMARY CARE OF CHILDREN III: CHRONIC HEALTH PROBLEMS, 2-5 cr. Management of selected chronic health care problems of children within the family context. Lect/sem 2, lab 0-3. Prereq: NRSG 822 or permission of instructor.
825 NEONATAL ASSESSMENT, 3 cr. In depth study of advanced neonatal assessment that incorporates knowledge of perinatal history taking, physical exam and common technologic procedures. Lect/sem 2, clin 1.

826 CURRICULUM DESIGN FOR THE FUTURE, 2 cr. Provides elements of curriculum design, including course and syllabus development, evaluation of student learning, and current issues in teaching college students. Includes history of higher education in health sciences and the role of the academician, emphasizing educational preparation of professional nurses.

827 EFFECTIVE TEACHING, 2-3 cr. Learn a variety of teaching strategies (classroom, seminar, distributive, laboratory and other simulated situations, clinical) designed to facilitate the development of knowledge and critical thinking of undergraduate and graduate students. Legal issues will be included. Lect/sem 2, Lab 1.

829 ADVANCED PRACTICE CNS CLINICAL PRACTICUM III, 5 cr. This course focuses on the application of principles of evidenced based practices delivered by advanced practice clinical nurse specialists (CNS) in the evaluation of quality care services in the areas of women’s, neonatal or children’s health care. Areas of evaluation include outcomes, costs and delivery systems for care. Prereq: NRSG 823, permission of instructor.

830 NEONATAL ASSESSMENT AND DIAGNOSTIC PRACTICUM, 2 cr. Preceptored practicum applying knowledge of assessments, radiological evaluation, laboratory interpretation and diagnostic reasoning for normal and high risk neonates. Pre-req: NRSG 825.


832 CARE OF HIGH RISK NEONATE, 2-5 cr. Didactic content in neonatal high risk care with the application of principles of assessment and management under the direction of a preceptor. Lect/Sem 2; Clin 0-3. Pre-req: NRSG 831.

833 ADVANCED ASSESSMENT IN WOMEN’S HEALTH CARE, 2-5 cr. Diagnostic reasoning for assessing, promoting, and maintaining health of women and management of common health problems and low risk pregnancy. Lect/sem 1-2, lab 0-3. Prereq: undergrad health assessment course, Pre- or coreq: NRSG 803, 883, or permission of instructor.

835 ADVANCED MANAGEMENT OF PREGNANCY, REPRODUCTIVE AND SEXUALITY ISSUES, 3-6 cr. Assessment and management of selected health care problems related to pregnancy, reproductive and sexuality issues. Lect/Sem 3, lab 0-3. Prereq: NRSG 833; Pre- or coreq: 818; or permission of instructor.

836 PROGRAM DEVELOPMENT OF HEALTH SERVICES FOR WOMEN AND CHILDREN, 3-4 cr. Program development of health services which promote health status indicators of women and children will be discussed. Advanced nursing skills and concepts specific to perinatal, midlife women’s, neonatal or children’s health care will be provided. Content related to program development specific to community health care using population based services will be applied. Theory 2; Clin 1-2. Prereq: NRSG 803, 820 or 833 or 884, permission of instructor.

837 ADVANCED MANAGEMENT OF MATERNAL AND WOMEN’S CHRONIC HEALTH CARE PROBLEMS, 2-5 cr. Assessment, diagnosis, and management of maternal and women’s health status over time with emphasis on stable chronic health care problems. Lect/Sem 2, lab 0-3. Prereq: NRSG 833 or permission of instructor.

838 EVIDENCED BASED QUALITY CARE PRACTICE FOR WOMEN AND CHILDREN, 3-4 cr. Application of principles of evidenced based practices delivered by advanced practice nurses in the design of quality care services in perinatal, midlife women’s, neonatal or children’s health care.
Content areas include the evaluation of outcomes, costs and health care systems. Theory 2; Clin 1-2. Prereq: NRSG 836 or permission of instructor.

839 ADVANCED WOMEN'S AND CHILDREN'S HEALTH NURSING PRACTICUM, 1-5 cr. Synthesis of advanced theoretical knowledge as a basis for advanced nursing practice with women and/or children, including neonates, within the context of their families. Lect/Sem 1, lab 0-5. Prereq: NRSG 824, 837, or 825.

840 COMMUNITY BASED CARE FOR VULNERABLE PEOPLE, 2 cr. Influence of rural, cultural and vulnerability theories and concepts on health status and health care delivery within a community based model. Physical, psychological, demographic, socioeconomic, and cultural issues influencing health status and health care delivery. Prereq: Permission of instructor.

841 HEALTH CARE SYSTEMS AND POLICY, 3 cr. Evaluation of health care systems and their effect on the health of populations. Emphasis on systems theory/thinking, case management health policy and strategies to influence systems. Sem 2, Prac 1. Prereq: NRSG 804 or permission of instructor.

842 COMMUNITY AND ORGANIZATIONAL DEVELOPMENT, 3 cr. Analysis of communities and organizations as a basis for fostering their development, with emphasis on change/transition theories, program planning/development, CQI tools and techniques, and outcome evaluation. Sem 3. Prereq: NRSG 804 or permission of instructor.

844 NURSING, HEALTH, AND CULTURE IN ORGANIZATIONS AND COMMUNITIES, 3 cr. Study of the influence of social and organizational culture on health conception and behavior with implications for practice and delivery of nursing and health care. Sem 2. Lab 1. Pre- or co-req: NRSG 841 or permission of instructor.

847 COMMUNITY ASSESSMENT AND HEALTH PROGRAMMING, 4 cr. Analysis of community systems and dynamics with examination of programming models to assess a community's health and delivery of health services to the community. Sem 2, Lab 2. Prereq: Epidemiology, NRSG 841, 842, 844, 871, and 872 or permission of instructor.

848 PRACTICUM IN MANAGING AND EVALUATING HEALTH OF POPULATIONS, 5 cr. Capstone course to examine in depth an individually selected aspect of managing and evaluating the health of a population with emphasis on application and synthesis of previous content. Sem 1, Lab 4. Pre- or co-req: NRSG 841, 842, 844, 847, 871, 872, and Epidemiology, or permission of instructor.

*849 ENTREPRENEURSHIP FOR HEALTH CARE PROVIDERS, 2 cr. Examination of the introductory marketing, human resource management, legal, tax, insurance, accounting and financing concepts applicable to the organization and management of profitable business ventures by self-employed health professionals and health professionals employed by a variety of organizations providing health care services. Seminar 2.

851 ADVANCED GERONTOLOGICAL NURSING: HEALTH PROMOTION, 3 or 6 cr. Focus on normal aging changes and comprehensive nursing assessment of older adults' health and functional status. Research-based interventions to promote wellness, prevent illness and enhance self-care capacity. Design of health promotion programs. Seminar 3, lab 3. Prereq: Adm. Graduate Nursing Program or permission of instructor.

852 ADVANCED GERONTOLOGICAL NURSING: HEALTH PROBLEMS, 3 or 4 cr. Selected clinical issues and health problems of older adults. Assessment and research-based intervention within a rehabilitative framework for advanced gerontological nursing practice. Clinical experience with chronically ill and older adults. Lect. 3, lab 1. Prereq: NRSG 851 or permission of instructor.

853 ADVANCED GERONTOLOGICAL NURSING IN THE AGING NETWORK, 3 cr. Overview of health and social policy issues and initiatives relevant to older adults. Study of continuum of health
and social services available in community. Emphasis on advanced nursing roles in providing care for older adults and families. Prereq: NRSN 861 or permission.

854 ADVANCED PRACTICUM IN GERONTOLOGICAL NURSING, 4-6 cr. Opportunity to implement advanced gerontological nursing practice roles. Objectives and activities determined in consultation with faculty. Focus on case management. Seminar 1, lab 3-5. Prereq: NRSN 851, 852, 853 (and 888 for GNP students); Coreq: 855; and permission.


856 ADVANCED GEROPSYCHIATRIC NURSING, 2 cr. Examination of issues and nursing management of selected psychiatric mental health problems of older adults and their families based on gerontological and psychiatric nursing knowledge. Seminar. Prereq: NRSN 863, 867, 852, 853, or permission of instructor.

862 COUNSELING MODELS IN ADVANCED PSYCHIATRIC MENTAL HEALTH NURSING, 2-3 cr. Application of counseling frameworks in the care of individuals, families, groups, and communities representing diversity in culture, lifestyle, and values. Emphasizes the counseling role of the psychiatric mental health advanced practice nurse (PMHAPN) as well as the concepts underlying nursing's practice of the counseling role, including ethical and legal considerations. Lab focus on the development of individual and group counseling skills for advanced nursing practice. Sem 2, Lab 0-1. Pre or co-req: NRSN 801, NRSN 885 or permission of instructor.

863 ADVANCED PSYCHIATRIC MENTAL HEALTH NURSING WITH ADULTS, 2 or 4 cr. The advanced nursing role in assessment, diagnosis, treatment, and management of psychiatric mental health problems in adulthood at the individual, family, and community levels. Sem 2, lab 0 or 2. Prereq: NRSN 862; pre- or coreq: NRSN 867, 883; or permission of instructor.

864 ADVANCED PSYCHIATRIC MENTAL HEALTH NURSING WITH CHILDREN AND ADOLESCENTS, 2 or 4 cr. The advanced nursing role in assessment, diagnosis, treatment, and management of psychiatric mental health problems in childhood and adolescence at the individual, family, and community levels. Sem 2, lab 0 or 2. Prereq: NRSN 862; pre- or coreq: 867, 883; or permission of instructor.

867 NEUROSCIENCE FOUNDATION FOR ADVANCED PRACTICE NURSING, 2-3 cr. The mind-body relationship as a foundation for the care of individuals and their families with actual or potential psychiatric mental health problems. Content will emphasize knowledge from basic neuroanatomy, neuroregulation, psychoendocrinology, and psychoimmunology for assessment, diagnosis, treatment, and management of psychiatric problems and promotion of well being. Diagnostic tests and neuro-imaging techniques will be examined for their usefulness in diagnosing and monitoring mental illness. Pre- or coreq: NRSN 862 or permission of instructor.

868 PRACTICUM IN ADVANCED PSYCHIATRIC MENTAL HEALTH NURSING, 1-8 cr. Development of additional clinical skills, including advanced nursing judgment, decision-making skills, and leadership. Specific learning objectives and setting(s) determined in consultation with faculty. Lab. Prereq: NRSN 862, 863, 864, 867, and 883, or permission.

869 ADVANCED INTEGRATED PRIMARY HEALTH CARE AND PSYCHIATRIC MENTAL HEALTH NURSING, 5 cr. Didactic content addresses nursing practice issues and health care policies affecting delivery of primary and mental health care. Practicum component integrates the knowledge and skills from primary care and psychiatric mental health care while managing patients with both primary care and mental health problems. Lect. 1, Lab 4. Prereq: NRSN 887 and NRSN 864 or permission of instructor.
871 INTRODUCTION TO HEALTH INFORMATICS 3 cr. Explores analysis and evaluation of information systems in health care organizations. Knowledge, skills, and abilities for using information technology to make decisions emphasized. Emphasizes information management and utilization within health systems. Sem 3. Prereq: NRSG 804, or permission of Instructor.

872 HEALTH CARE ECONOMICS AND FINANCIAL MANAGEMENT, 3 cr. Examination of health care economic trends, reimbursement issues, funding sources, and related ethical issues. Introduces financial analysis, cost analysis, budgeting, and business planning. Sem 3. Pre- or co-req: NRSG 801 and 804, or permission of instructor.

873 DEVELOPING SYSTEMS AND INFRASTRUCTURES IN HEALTH CARE ORGANIZATIONS, 3-5 cr. Exploration of leadership and management knowledge as they relate to supporting and maintaining mission of health care organizations. Emphasis is on developing leadership skills, analyzing systems to promote transitions, and managing units, departments, or programs strategically. Lect. 3, clin. lab 2. Pre-or co-req: NRSG 801, 804, 841, 842, 844, 871, 872, or permission of instructor.

874 PRACTICUM IN MANAGING AND EVALUATING IN HEALTH CARE ORGANIZATIONS, 4 cr. Seminar and clinical management and evaluation experiences in a health care organization. Emphasis is on developing leadership, management, and evaluation skills, enhancing personal effectiveness, and integrating knowledge into the practice role of a nursing administration specialist. Lect. 1, clin. lab 3. Prereq: NRSG 841, 842, 871, 872, 873.

875 HEALTH INFORMATICS SYSTEMS ANALYSIS AND DESIGN, 3 cr. Information system development life cycle will be introduced with emphasis on determination of nursing information requirements for healthcare, analysis of information system needs, and design of a system to meet healthcare information requirements. Lect. 2, lab 1. Prereq: NRSG 871, permission of instructor.

876 PRACTICUM IN IMPLEMENTATION AND EVALUATION OF CLINICAL INFORMATION SYSTEMS, 4 cr. Clinical information system implementation and support strategies will be introduced with emphasis on documentation, training and educational programming, and system maintenance. Information system testing and evaluation strategies will be explored. Lect. 2, lab 2. Prereq: NRSG 875, or permission of instructor.

877 DATABASE DESIGN FOR HEALTH SYSTEMS, 4 cr. Data management strategies with emphasis on development of data and information models that support health care systems. The course introduces the conceptual and practical foundation necessary for analysis, design, implementation, and use of information systems. Lect. 3, lab 1. Prereq: Admission to program or permission.

880 COMPLEMENTARY THERAPIES IN HEALTH CARE, 2 cr. Provides an understanding of theory, research and practice in a variety of complementary health care modalities. Research, efficacy, cost and ethics will be included. Seminar 2.

882 ADVANCED HEALTH ASSESSMENT, 3 cr. Comprehensive, interval and problem focused assessment of individuals and families across the lifespan. Included are history-taking, physical examination, health problem identification, and ambulatory care procedures. Lab 3. Prereq: NRSG 258 or equivalent undergraduate health assessment course, admission to program, and permission.

883 APPLIED PHARMACOLOGY FOR ADVANCED PRACTICE NURSES, 3 cr. Provides advanced clinical pharmacological management skills in delivering health care. Addresses pharmacodynamic and pharmacokinetic properties of medications recommended or prescribed in primary and other health care settings. Prereq: Undergrad pharmacology course or permission.
884 PHARMACOTHERAPEUTICS FOR NEONATAL CARE, 3 cr. Principles of pharmacology for the neonate with the emphasis on nutrition, pain management, medications in ventilation therapy, drug administration and effects of prenatal substance abuse.

885 ROLE ISSUES FOR THE ADVANCED PRACTICE NURSE, 1 cr. The role of the advanced practice nurse within the health care system, multidisciplinary health team, and nursing is analyzed. Professional and societal forces shaping primary health care and the advanced practice nurse role are examined. Lect 1. Prereq: Adm. Graduate Nursing Program and permission of instructor.

886 ADVANCED HEALTH PROMOTION, 3 cr. Assessment and interventions for risk management, disease prevention, and case findings for individuals and families across the lifespan. Lect 3. Prereq: Admission to program and permission. Twelve (12) months of recent full-time clinical experience per CON policy. Co-req: NRSG 882.

887 PRIMARY HEALTH CARE OF YOUNG FAMILIES, 3-7 cr. Knowledge and skills for providing primary health care to children and childbearing families. Lect 3, lab 4. Prereq: NRSG 886 and permission of instructor.

888 PRIMARY HEALTH CARE OF OLDER FAMILIES, 3-6 cr. Knowledge and skills for providing primary health care to middle-aged and older families. Focus is on risk management and care of acute and chronic illnesses. Lect 3, lab 3. Prereq: NRSG 886 or NRSG 851 and permission of instructor.

889 ADVANCED PRIMARY HEALTH CARE OF FAMILIES, 3-6 cr. Comprehensive primary health care is provided to individuals and families across the life span. Didactic content addresses advanced nursing practice issues and health care policies affecting delivery of primary health care. Lect 1, lab 5. Prereq: NRSG 887, 888 and permission of instructor.

890 SPECIAL TOPICS IN ADULT HEALTH NURSING, 1-6 cr.

891: SPECIAL TOPICS IN NURSING ADMINISTRATION, 1-6 cr. Independent study course exploring selected topics or clinical problems related to Nursing Administration advanced practice. Seminar or clinical practicum format. Topics will vary. Permission of Instructor.

892 SPECIAL TOPICS IN PSYCHIATRIC MENTAL HEALTH NURSING, 1-6 cr. Prereq: Permission of instructor.

893 SPECIAL TOPICS IN GERONTOLOGICAL NURSING, 1-6 cr. Prereq: Permission of instructor.

894 SPECIAL TOPICS IN PARENT-CHILD NURSING, 1-3 cr.

895 SPECIAL TOPICS IN COMMUNITY HEALTH NURSING, 1-6 cr. Pre-req: Permission of instructor.

896 RESEARCH IN CLINICAL NURSING, 1-6 cr. Prereq: NRSG 805 and graduate statistics.

897 SPECIAL TOPICS IN PRIMARY HEALTH CARE NURSING, 1-6 cr. Prereq: Permission of instructor.

898 SPECIAL TOPICS (CLINICAL) IN PRIMARY HEALTH CARE NURSING, 1-6 cr. Prereq: Permission of instructor.

901 RESEARCH DESIGN AND METHODS I, 3 cr. Focus on common experimental and non-experimental designs applicable to investigation of nursing research questions. Aims/hypothesis development, sampling, methods of data collection, reliability and validity of measurement, data analysis, and issues related to the use of human subjects specific to designs examined. Labs focus
on selected analytic skills and techniques. Prereq: NRSG 902, 904; pre- or co-requisite ANOVA and regression, NRSG 906.

902 THEORY DEVELOPMENT IN NURSING AND HEALTH CARE, 3 cr. Opportunities to develop, analyze and test theories. This knowledge forms the foundation for the development of conceptual and theoretical frameworks from which hypotheses are generated and tested. Prereq: Adm. to doctoral program in nursing or permission of instructor.

904 CONCEPTS IN HEALTH AND ILLNESS I, 2 cr. Critical analysis of concepts from the physiological, psychosocial, and/or health systems perspectives with synthesis of literature and identification of gaps in knowledge. Beginning development of concepts and relationships for dissertation proposal. Pre- or co-requisite NRSG 902 or permission.

905 ADVANCED SEMINAR IN NURSING, 2-3 cr. Students focus on selected research problems, methods and/or other specific topic areas. Topics will vary depending upon the needs and interests of students. Doctoral students must take at least two semesters and a minimum of 4 cr. Prereq: Adm. to doctoral program in nursing or permission of instructor.

907 CONCEPTS IN HEALTH AND ILLNESS II, 2 cr. Continued in-depth study of selected concepts with emphasis on relationship to other concepts and on measurement of concepts. Prereq: NRSG 904.

908 RESEARCH DESIGN AND METHODS II, 3 cr. Focus on more complex experimental and non-experimental designs applicable to the investigation of nursing research questions. Aims/hypothesis development, sampling, methods of data collection, reliability and validity of measurement, data analysis, and issues related to the use of human subjects specific to the designs examined. Labs focus on selected analytic skills and techniques. Prereq: successful completion of qualifying examination, NRSG 901. Co-req: multivariate statistics.

910 HEALTH-RELATED INSTRUMENT CONSTRUCTION AND EVALUATION, 3 cr. Provides a knowledge base and experience in the inductive and deductive process for constructing and evaluating instruments to measure psychosocial, behavioral, biophysiological and clinical phenomena. Seminar 3; Seminar 2, lab 1, weeks 2-5. Prereq: Intermediate statistics and NRSG 903 and 904 or disciplinary equivalent, or permission of instructor.

914 SYMPTOM MANAGEMENT FOR ACUTE AND CHRONIC ILLNESS, 3 cr. Designed for doctoral students interested in developing and implementing symptom management interventions for aggregate populations of patients with acute and chronic illnesses. Emphasis will be on the fatigue, pain, sleep disturbance, and dyspnea as individual symptoms or as a cluster of symptoms. Lect 3. Prereq: NRSG 901, 902, 904, 907, 908 or permission of instructor.

916 SPECIAL TOPICS IN THE MANAGEMENT OF INDIVIDUAL AND FAMILY RESPONSES TO ACUTE AND CHRONIC ILLNESSES, 1-6 cr. Prereq: Admission to Ph.D. program.

917 SPECIAL TOPICS IN HEALTH PROMOTION AND DISEASE PREVENTION, 1-6 cr. Prereq: Admission to Ph.D. program.

918 SPECIAL TOPICS IN HEALTH SYSTEMS, 1-6 cr. Prereq: Admission to a Ph.D. program.

920 GRANT APPLICATION AND MANAGEMENT, 2 cr. All aspects pertaining to the preparation of applications for research funds are addressed, including funding sources, proposal writing and administration of funded proposals.

925 HEALTHY LIFESTYLE BEHAVIOR THEORY AND INTERVENTIONS, 3 cr. This course provides an opportunity for synthesis and integration of knowledge regarding the phenomenon of healthy lifestyle behavior. The focus is on critical examination of multidisciplinary theoretical and empirical literature concerning selected frameworks/models of determinants of behavior and
intervention methods for healthy lifestyle behavior change research. Emphasis is on applicability to research and practice. Sem 3. Prereq: NRSG 901, 902, 907, 904 and statistics or permission of instructor.

926 USE OF TECHNOLOGY TO DELIVER AND MONITOR INTERVENTIONS AND OUTCOMES, 3 cr. Develop and implement interventions and/or measuring outcomes for aggregate populations using technologies. Evaluate the different types of technologies used for specific applications and demonstrate an understanding of the biopsychosocial theories that underpin the use of technology. Develop expertise in using emerging and innovative technologies with particular emphasis on store-and-forward technology; self-monitoring/testing with technological devices; and technology to deliver and monitor interventions. Lec. 3. Prereq: NRSG 901, 902, 904, 907, or permission of the instructor.

927 PHYSICAL ACTIVITY IN CLINICAL RESEARCH, 3 cr. This course will focus on theoretical approaches and measurement issues in the study of physical activity/exercise. Particular emphasis will be placed on self-report and physiological measures in selected client populations and settings. Practical issues of using technology in the design and implementation of physical activity/exercise will be discussed. Lec. 3, Prereq: Graduate level Exercise Physiology course, NRSG 901 and 904 or permission of instructor.

928 INTERDISCIPLINARY OUTCOMES RESEARCH, 3 cr. This course focuses on measurement, management, and evaluation of health care outcomes with a focus on the end-results of care. The Medical Outcomes Study conceptual framework (Structure of Care, Process of Care, and Outcomes) with an emphasis on the broad categories of outcome types: clinical end points, functional status, general well-being, satisfaction with care, and economic evaluations will be employed. The course analyzes the system model of quality improvement as an alternate paradigm for studying outcomes. Additionally, the design and use of information systems for outcomes research will be integrated throughout the course. Lect. 3. Pre-requisites: NRSG 901, 902, 904, 907, 908, and multi-variate statistics, or permission of the instructor.

970 DOCTORAL RESEARCH OTHER THAN DISSERTATION, 1-6 cr. Each doctoral student participates in an ongoing research project (other than dissertation) under the direction of faculty. Doctoral students must take at least two semesters and a minimum of 4 credits.

998 DOCTORAL SEMINAR, 1 cr. Students actively participate in seminar discussion in the area of their dissertation research, including but not limited to application of research conceptualization and methods, synthesis of work from prior course. Prereq: passing of qualifying examination. Cannot be taken concurrently with NRSG 920. Doctoral students must enroll in this course each semester between completion of NRSG 920 and successful dissertation defense.

899 MASTER'S THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Pathology and Microbiology

Graduate committee: Associate Professor Chapman (Chair); Professors Carson, Jerralls; Associate Professors Fey, Jackson, Johnson, Singh.

An applicant may apply to either the Master of Science degree program or the Doctor of Philosophy degree program.

For admission to the program, the applicant should have a Bachelor’s degree in Science with a broad background in biological sciences, including courses in organic and quantitative chemistry, biochemistry, mathematics, and physics. The applicant must present an academic record and background that are acceptable to the Graduate Committee. To be acceptable, the record and background must include the following or their equivalent:

- Baccalaureate degree with a major in biological or physical sciences
- One academic year of general physics
- Two academic years of chemistry, including organic chemistry
- Twelve semester credit hours in biological sciences
- Three semester credit hours of calculus

Applicants who are deficient in one or two of the course requirements for admission, but who are otherwise well qualified, may be admitted on the provision that deficiencies are removed prior to admission to candidacy.

All application materials required by the Graduate Studies Office must be supplied before action can be taken on a candidate’s application. Written letters of recommendation, and personal motivation as judged by the student’s personal statement influence evaluating the potential and ability of the applicant to complete a rigorous course of advanced and original studies in a field of modern biology. If it is considered appropriate and necessary to the evaluative process, the applicant will be invited for an interview. For favorable consideration by the departmental Graduate Committee, it is strongly recommended that the applicant’s grade point average be at the level of B or higher. Ph.D. applicants must take the GRE examination and score above the 40th percentile.

Pathology and Microbiology (PAMM)

*857 MEDICAL IMMUNOLOGY, 2 cr. A study of the basic concepts and mechanisms of modern immunology with discussion of the applications of these principles to the study of diseases.

873 INTRODUCTION TO GENETIC SEQUENCE ANALYSIS, 2 cr (BIOC 873). Fundamentals of using online search techniques for the analysis of genetic sequence databases. The course will be taught in UNMC computer clusters by lecture and by the completion of assignments using computer programs available on campus. Programming experience is not required. Prereq: Intro to Computational Molecular Biology, undergraduate course in biochemistry or molecular biology, or permission of instructor.

880 PRINCIPLES AND METHODOLOGIES IN CANCER RESEARCH, 3 cr I (BIOC 880, CRGP 880, PHAR 880, PHSC 880). The course surveys the biology and biochemical mechanisms underlying cancer development, prevention and therapy. Prereq: BRTP 821, 822, 823 and 824 or equivalent, permission of instructor.

885 BIOTECHNOLOGY TODAY, 4 cr. The course emphasizes scientific strategies and technologies in Biotechnology. Emphasis is also on "business" aspects including: patent law, licensing, clinical trial design and regulatory issues. Prereq: Permission of instructor.

890 THE MOLECULAR BIOLOGY OF VIRUSES, 3 cr I. The principles of molecular biology and their application to the study of virology will be presented. The contributions of virology to the understanding of general mechanisms of pathogenesis will be discussed.
896 RESEARCH OTHER THAN THESIS, cr arr. By permission.

898 MICROBIOLOGY, 3 cr. Lecture/discussion survey course provides a balanced program of study in medical microbiology, including basic principles of structure and function, growth and its control, genetics, metabolism, and pathogenicity of bacteria, viruses, parasites, and fungi. Basic aspects of the major infectious diseases caused by the organisms in each of these categories will be discussed. Prereq: Permission of instructor.

922 NEUROIMMUNOLOGY, 3 cr. The course is designed for in depth study of neuroimmunology, neurovirology, and neurodegenerative disorders. Special emphasis will be on HIV-1 encephalitis, Alzheimer's disease, Parkinson's disease, multiple sclerosis and Amyotrophic Lateral Sclerosis (ALS). Prereq: BRTP 821/822, 824, BIOC 841/842, CBA 922 or 932, or PAMM 857.

940 MOLECULAR BASIS OF HUMAN DISEASE, 3 cr. Beginning with an overview of human genetics, including classical and contemporary methods of genetic analysis, the course explores the relationship between genetic diversity and disease. Human biochemical genetics and inborn errors of metabolism illustrate how specific phenotypes result from specific gene changes. Genetic polymorphism, selection and fitness are also explored with regard to the interactions among human populations and with the environment. Prereq: 800-level Biochemistry or permission.

815 HISTORY AND PHILOSOPHY OF PUBLIC HEALTH 3 cr. This course examines historical and philosophical themes in public health. Topics include the nature and value of health; explanations of disease; conflicts among individuals, society, and the environment; the roles of government, communities, and health professionals; interpretations of health disparities; concepts of risk; and old and new conceptions of public health. Historical case studies will cover such topics as the Black Plague, Yellow Fever in the South, the spread of smallpox in the Americas, the 1918 flu epidemic, the 1995 Chicago heat wave, the obesity epidemic, HIV, and persistent organic pollutants. Class discussion will be supplemented by lectures and visiting speakers. Students are expected to participate actively in discussions, reading, writing, and presenting topics.

950 SPECIAL TOPICS, 1-3 cr. Advanced study of current concepts and findings in selected areas of pathobiology, microbiology, and immunology. Includes a review of current literature, research and clinical problems. Prereq: Permission of instructor.

955 ADVANCED IMMUNOBIOLOGY, 3 cr. Conceptual study of cellular and biomolecular immunology. Includes mechanisms of immune recognition, regulatory and effector functions, interleukins and clinical immunology, with discussion of current literature. Prereq: PAMM 857, BRTP 824, or permission.

956 ADVANCED IMMUNOLOGY LABORATORY, 2 cr. Techniques of immunology with emphasis on T and B cell identification, studies of lymphokine activities, lymphocyte effector function, monoclonal antibodies, and biotechnology. Lab 4. Prereq: Prior or concurrent PAMM 955.

970 SEMINAR, 1 cr. By permission.

992 ADVANCED TOPICS IN MICROBIOLOGY - BIOMEDICAL LITERATURE, 1 cr. Study of the current scientific literature with emphasis on new and emerging diseases, treatment and technologies. By permission.

899 MASTER'S THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Pharmaceutical Sciences

Graduate Committee: Uday Kompella, Ph.D. (Chair), Jonathan Vennerstrom, Ph.D., Tanya Bronich, Ph.D., Vinod Labhasetwar, Ph.D. and Dennis Robinson, Ph.D. (ex-officio).

The Pharmaceutical Sciences Graduate Program is intended for those who wish to pursue a program of study leading to the Master of Science or Doctor of Philosophy degrees.

Admission requirements. Applicants should have a B.S. degree in pharmacy, biology, chemistry, engineering, mathematics, or related areas with a grade average of 3.0 or better on a 4.0 scale. The Graduate Record Examination is required for all applicants.

Course requirements. The course of study for M.S. and Ph.D. students will be determined by the advisory or supervisory committee, respectively. The M.S. degree may be earned only under Option One. Each M.S. and Ph.D. student must take at least six courses from those listed under Pharmaceutical Sciences (PHSC) or from the following courses offered by other departments at UNMC and UNO.

At UNMC these courses are: BRTP 821 Macromolecular Structure and Function; BRTP 822 The Cell and Gene Regulation; BRTP 823 Molecular Cell Biology; BRTP 824 Cell Signaling; P-SM 806 Biostatistics I; P-SM 808 Biostatistics II.

At UNO these courses include: CHEM 8246 Advanced Organic Chemistry (Mechanisms); CHEM 8236 Advanced Organic Chemistry (Synthesis); MATH 8005 Statistical Methods I; and MATH 8015 Statistical Methods II.

Pharmaceutical Sciences (PHSC)

820 SELECTED TOPICS IN THE PHARMACEUTICAL SCIENCES, 1-2 cr I, II. A detailed study of specific subject areas related to the pharmaceutical sciences. Evaluation and discussion of the scientific literature is an integral part of the course. Prereq: Permission of instructor.

830 ADVANCED MEDICINAL CHEMISTRY, 3 cr odd yrs. This course will apply essential concepts of medicinal chemistry at an advanced level. Receptor theory, stereochemistry, chemical bonding, and bioisosterism will be discussed as they relate to drug design. Prereq: PHSC 626 or equivalent.

843 SPECTROSCOPIC ORGANIC STRUCTURAL ANALYSIS, 3 cr even yrs. This course deals with a theoretical and practical understanding of UV, IR, NMR and MS applied to organic structural elucidation. The advantages, disadvantages, limitations, and appropriate use of each spectroscopic technique will be described. Prereq: First year organic chemistry.

845 QUANTITATIVE PHARMACEUTICAL ANALYSIS, 3 cr I. A lecture and laboratory course covering the theory and applications of current analytical methods for the quantitative determination of drugs, metabolites, and other biologically active agents. Lect 3, lab 3. Prereq: first year organic chemistry and permission of instructor.

851 INNOVATIVE DRUG DELIVERY SYSTEMS, 3 cr II odd yrs. This course will examine the innovations in the design, preparation, and evaluation of modern drug delivery systems. Prereq: permission of instructor.

861 ADVANCED PHARMACOKINETICS AND PHARMACODYNAMICS, 3 cr I even yrs. The mathematical description of the rate and extent of drug absorption, distribution, elimination and action. Prereq: PHSC 674 or permission of instructor.

875 CHEMICAL CARCINOGENESIS, 2 cr II even yrs. This course will present the basic concepts of chemical carcinogenesis, and introduce the major carcinogens, their biochemical activation and mode of action. Prereq: Biochemistry or permission of instructor.
880 PRINCIPLES AND METHODOLOGIES IN CANCER RESEARCH, 3 cr (BIOC 880, CRGP 880, PAMM 880, PHAR 880). See BIOC 880 for course description.

885 PHYSICAL PHARMACY, 4 cr II odd yrs. A study of physicochemical principles applicable to drug delivery systems, with emphasis on solubility, diffusion, dispersed systems, and stability testing. Prereq: PHSC 870 or permission of instructor.

890 POLYMER THERAPEUTICS, 3 cr. I even yrs. A study of the physicochemical and biomedical properties of synthetic polymers with an emphasis on their application as modern therapeutics. Prereq: permission of instructor.

896 SPECIAL PROBLEMS IN PHARMACEUTICAL SCIENCES, 1-8 cr. Prereq: Permission of instructor.

921 BIOPHYSICAL CHEMISTRY, 3 cr II even yrs. The course will cover the biophysical chemistry of nucleic acids and proteins including the study of these molecules using NMR, calorimetry, and fluorescence. Prereq: Permission of instructor.

924 DRUG METABOLISM AND DISPOSITION, 3 cr I even yrs. An in-depth consideration of the various factors which influence the metabolism of drugs and foreign chemicals (xenobiotics). Prereq: Biochemistry and permission of instructor.

950 ADVANCED TOXICOLOGY, 3 cr II odd yrs. This course deals with the adverse effects of chemicals on biological systems. Physiological and biochemical mechanisms of toxicity at the cellular and subcellular levels will be emphasized. Prereq: Permission of instructor.

960 CURRENT TOPICS IN THE PHARMACEUTICAL SCIENCES, 1 cr I, II. This course is mandatory for all students enrolled in the Pharmaceutical Sciences Graduate Program. Prereq: Permission of instructor.

970 SEMINAR IN PHARMACEUTICAL SCIENCES, 1 cr.

899 MASTER’S THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Pharmacology

Graduate committee: Associate Professor Zheng (Chair); Professors Monaghan, Toews; Associate Professors Ikezu, Persidsky, Thoreson.

The objective of the Pharmacology and Experimental Neuroscience graduate program is to train individuals as research scientists and educators in the fields of pharmacology and neuroscience. The program provides students with exposure to diverse areas of pharmacology and neuroscience in a stimulating research environment with state-of-the-art techniques and well-supported core facilities. This program now offers two separate tracks, one in Pharmacology and one in Neuroscience. Students in both tracks participate in highly integrated research programs that encompass cellular and molecular biology; systems physiology and integrative pharmacology; diverse areas of neurosciences including neurochemistry, neuropathology and neuropharmacology; and multiple aspects of cellular immunology, immunopathology, virology, and toxicology.

Courses for the Pharmacology track focus on studies of drugs and their effects and clinical uses, with an emphasis on the drug receptors and cellular signaling pathways that mediate their actions. Courses for the Neuroscience track focus on studies of neurons and other cells associated with the normal physiology and/or disease pathology of the central and autonomic nervous systems, with an emphasis on neuropharmacology, neurovirology, and neuroimmunology. The program is designed specifically to prepare students to receive the Ph.D. degree. The opportunity to study toward both the M.D. and Ph.D. degrees is available to select students. The M.S. degree can also be obtained in special circumstances.

Admission requirements. Admission to the program leading to the Ph.D. degree may be granted to individuals holding the baccalaureate (or higher) degree from an accredited college or university, who have a grade average of B or better. Grades in science must be excellent. Admission requirements include course work in mathematics through calculus; chemistry, including organic chemistry; physics; and biology or zoology. The Graduate Record Examination (GRE) is required for all applicants. Upon admission to the program, a student will be advised of any deficiencies, which must be made up within the first year after entering the program. The prerequisite courses may not be substituted for required courses in the program. Research experience also enhances the applicant's preparation for graduate studies in pharmacology and neuroscience. Results from the GRE, transcripts, and three letters of recommendation are required of all applicants.

Applicants for whom English is not their native language must submit TOEFL scores, with a minimum score of 600 (paper-based) or 250 (computer-based) usually required for admission. Students are selected for admission on the basis of overall undergraduate grade point average, standardized test scores, letters of recommendation, and the personal statement (see application form).

Program of study. Since pharmacology and neuroscience are both based on a thorough understanding of the basic principles of physiology and biochemistry, appropriate courses are taken in these subjects prior to taking further courses focused on pharmacology and neuroscience. In addition, courses in anatomy, cell biology, microbiology, or immunology and pathology may be included in the graduate curriculum.

All students working toward a Ph.D. or M.S. degree must complete Macromolecular Structure and Function (BRTP 821), The Cell and Gene Regulation (BRTP 822), Molecular Cell Biology (BRTP 823) and Cell Signaling (BRTP 824), usually completed during the first year. During the second year, students take advanced coursework, either those courses required for the Pharmacology track (PHAR 815/816 Medical Pharmacology I/II and PHAR 901 Receptors and Cell Signaling) or those for the Neuroscience track (PHAR 901 Receptors and Cell Signaling, PHAR 922/GCBA 922 Neurobiology I & GCB 932 Neurobiology II, and PAMM 922 Neuroimmunology or PHAR 950 Special Topics in Clinical Neuroscience). Students are also required to enroll in Pharmacology Seminar (PHAR 970) and to participate in departmental journal clubs each year. Additional course work to meet the student's
special interests will be recommended by the student’s Supervisory Committee. A grade of B is the minimum acceptable grade in all pharmacology and neuroscience courses.

Students in both tracks are required to pass a comprehensive examination, usually at the end of the second year or early in the third year, in order to be admitted into candidacy for the doctoral degree. The examination consists of a formal written research proposal and an oral examination based on the proposal but covering all aspects of the student’s training and knowledge. The most important component of the graduate training program is the completion of a sufficient body of original research to generate a doctoral dissertation or master’s thesis and the student’s successful oral defense of that dissertation. Most students complete their dissertation research in about 5 years, though the time is variable depending on the student’s project, abilities, and effort.

Pharmacology (PHAR)

*815 MEDICAL PHARMACOLOGY I, 5 cr I. General principles governing drug absorption, distribution, and excretion, the molecular mechanisms of drug action, and the basic and clinical pharmacology of the autonomic, endocrine and cardiovascular systems. Prereq: Permission.

*816 MEDICAL PHARMACOLOGY II, 4 cr II. Basic and clinical pharmacology of agents affecting the central nervous system, pulmonary and musculoskeletal systems, the kidney and gastrointestinal tract, and infectious and malignant processes. Prereq: PHAR 815 and permission.

880 PRINCIPLES AND METHODOLOGIES IN CANCER RESEARCH, 3 cr I (BIOC 880, CRGP 880, PAMB 880, PHSC 880). See BIOC 880 for course description.

896 RESEARCH OTHER THAN THESIS, 1-9 cr. Prereq: Permission.

901 RECEPTORS AND CELL SIGNALING, 3 cr. A detailed description of receptors in terms of their roles in the recognition of neurotransmitters, drugs and hormones, and their regulation of signal transduction pathways in the cell. Discussion of the methods for in vitro and in vivo analysis of receptors is included. Prereq: PHAR 815 or permission.

905 MOLECULAR PHARMACOLOGY, 2 cr. An extensive treatment of alterations in cellular activity and function which are induced by drugs. Topics include receptor-mediated events, alterations in gene expression, gene therapy, metabolic and toxic responses to drugs and pharmacokinetics. Prereq: PHAR 815 or permission.

922 NEUROBIOLOGY I, 3 cr I (CBA 922). See CBA 922 for course description.

950 SPECIAL TOPICS IN PHARMACOLOGY, cr arr. Consult the current listing of graduate course offerings for the particular topic being offered. Prereq: Permission of instructor.

970 SEMINAR, 1 cr.

899 MASTER’S THESIS

999 DOCTORAL DISSERTATION
Programs and courses

Master of Public Health

Graduate committee: Assistant Professor Schumaker (Chair-UNO), Professors Anderson (UNMC), Corbin (UNO), Jameton (UNMC), Stacy (UNO), VonEssen (UNMC); Associate Professors Medder (UNMC), Assistant Professors Barnes-Josiah (UNMC), Brown (UNO), Head (UNMC), Meza (UNMC), Wilson (UNO). Ex-officio members: Valdeen Nelsen (MPH Coordinator), Steven Jackson - Student, Public Health Administration (UNMC), Brandon Grimm - Student, Community Health Education (UNO).

Admission requirements: Applicants seeking admission to the MPH program (concentration areas: Public Health Administration OR Community Health Education) must have an earned baccalaureate degree or equivalent from an accredited institution of higher education. They must submit three official transcripts reflecting either a 3.00 GPA on a 4.0 scale for the last 60 undergraduate credit hours earned or a 3.00 GPA on a 4.0 scale for the last 18 graduate credit hours earned. Applicants must also submit the MPH program Application Addendum, located on the program website at www.unmc.edu/ MPH, a resume reflecting work history related to essential public health functions and three letters of recommendation from academic or professional references. Finally, a personal essay is required, identifying why the applicant wants an MPH degree, how he/she plans to use the education after graduation, what public health means to him/her and how they became interested in it, including a demonstration of the applicant’s writing/communication skills and a self-assessment of the applicant’s quantitative/analytic skills, personal strengths and general preparation for succeeding in a graduate program.

International applicants must submit official GRE scores. Students applying to the MPH program will be required to demonstrate acceptable proficiency in English before they are considered eligible for admission or graduation. Applicants whose primary language is not English must present official scores on the Test of English as a Foreign Language (TOEFL). A score of at least 550 on the paper-based TOEFL or 213 on the computer-based TOEFL is required.

Application materials, must be submitted for consideration by April 15 for the fall semester, or by September 1 for the spring semester.

Required courses: The MPH is a specialized professional masters degree program designed to prepare graduates for work in public health. This value-based academic program will emphasize the areas of prevention, scientific knowledge base, interdependency with other areas of knowledge and practice, and social justice. Material in core, concentration and elective courses will pay particular attention to health status, health outcomes, and health needs in special populations (e.g., racial and ethnic minorities, children, women). Statistics related to these populations, as well as cultural and etiological considerations will be discussed throughout the curriculum in an effort to instill in students the need for awareness of the health differences in population groups. The goal of this orientation is to equip program graduates to address society’s public health needs.

The program requires 39 semester credit hours, to include:

- 15 credit hours in five core areas: biostatistics, epidemiology, environmental health, health services administration, and social/behavioral science - 3 credit hours each. (List of courses available from the MPH Program).
- 12 credit hours of concentration area course work in either community health education OR public health administration. (List of concentration area courses available from the MPH Program).
- 6 credit hours of electives (List of electives are available from the MPH Program).
- 6 credit hours of Service Learning/Capstone Experience work associated with the appropriate concentration area (Guidelines available from the MPH Program).

*Course descriptions can be found in either the UNMC or UNO Graduate Studies bulletin or from the MPH Program.
Service Learning/Capstone Experience: 300 contact hours of community service/learning, along with a paper and oral presentation summarizing the experience are required for graduation. The Service Learning/Capstone Experience provides students an opportunity to integrate classroom learning with practical, on-the-job training in public health related planning or service organizations. It will require students to develop the capacity to organize, analyze, interpret, and communicate knowledge in an applied manner through a planned, supervised, and evaluated service/learning experience.
Programs and courses

Toxicology

Graduate committee: Professor Siegfried (Co-Chair, UNL) and Associate Professor Sanderson (Co-Chair, UNMC); Professors Monaghan (UNMC), Associate Professors Berkowitz (UNL), Floreani (UNMC), Hage (UNL).

Admission requirements for the Ph.D. and M.S. degrees. Students seeking admission must have a baccalaureate degree and should submit official Graduate Record Examination (GRE) scores as part of their application. They should be able to demonstrate a satisfactory background in science and math areas relevant to toxicology, including basic chemistry, basic biology, and calculus. Applicants whose native language is not English must present a TOEFL score of 550 (paper-based) or 213 (computer-based) or higher. The application must include a statement of intent (up to five double-spaced pages) describing the applicant's interest in pursuing an advanced degree in toxicology. At least three letters of recommendation are required, including at least two from academicians.

The Toxicology graduate program is intended for those who wish to pursue a M.S. or Ph.D. degree in the multidisciplinary field of toxicology.

Required courses. All students (M.S. and Ph.D.) are required to complete successfully two semesters of biochemistry, a semester of statistics and two semesters of toxicology. Biochemistry courses are available at UNMC (BRTP 821, 822, 823, & 824) and UNL (BioChm 831/832). Students may take Biostatistics I at UNMC (P-SM 806) or Statistical Methods in Research at UNL (Biometry 801). Principles of Toxicology and Advanced Toxicology will be provided to students on both campuses. All students must participate in the Center seminar series.

Master of Science degree. Track 1 (Ph.D. track) requires a minimum of 30 credit hours, 20-24 hours of course work and 6-10 hours of thesis. Half of the total credit hours, including thesis, must be in the major. Track 2 (non-Ph.D. track) requires a minimum of 36 credit hours with, for UNL, a minimum of 18 hours in the major or two minors of 9 hours with 15 hours in the major. No thesis is required. At least 12 credit hours must be in upper level (800/900) level courses.

Doctor of Philosophy degree. In addition to the required courses, at least two elective 800/900 level courses must be taken. A dissertation with an oral defense must be presented. During the second or third year, a grant proposal must be prepared on a subject related to toxicology, yet outside the immediate area of dissertation research. The proposal must conform to the guidelines of an appropriate federal agency (NIH, NSF, USDA, DoD, etc.). After review by the Supervisory Committee and other selected reviewers, the student must defend the grant proposal in an oral examination covering the proposal and related subject material. All students are required to submit at least one scientific article for publication. Students must participate in the Center seminar program, attending a minimum of 12 seminars.

Toxicology (TOX)

875 CHEMICAL CARCINOGENESIS (PHSC 875), 2 cr II even yrs. This course will present the basic concepts of chemical carcinogenesis, and introduce the major carcinogens, their biochemistry of activation and mode of action. Prereq: Biochemistry or permission of Instructor.

888 PRINCIPLES OF TOXICOLOGY, 3 cr. An introduction to the principles of toxicology, mechanisms of toxicity, measures used in the treatment of poisoning and specific information pertaining to the categories of toxic agents responsible for the majority of toxicological emergencies.

896 RESEARCH OTHER THAN THESIS, 1-9 cr.
902 SPECIAL TOPICS, 1-3 cr. Presented at intervals depending upon the interest of the faculty or the request of students. A description of each course with its prerequisites is announced at the time the course is given.

950 ADVANCED TOXICOLOGY (PHSC 950), 3 cr II odd yrs. This course deals with the adverse effects of chemicals on biological systems. Physiological and biochemical mechanisms of toxicity at the cellular and subcellular levels will be emphasized. Prereq: Permission of instructor and TOX 888 or equivalent.

970 SEMINAR, 1 cr.

899 MASTER'S THESIS

999 DOCTORAL DISSERTATION
The Graduate Faculty

AHMAD, IQBAL, Professor of Ophthalmology, of Pharmacology, of Pathology and Microbiology, and of Eppley Institute, B.S. 1980, M.S. 1983 Patna (India); Ph.D. 1990 Kent State.

AITA, VIRGINIA A., Associate Professor of Preventive and Societal Medicine and of Family Medicine, B.S. 1966 Iowa; M.S. 1970 Maryland; Ph.D. 1995 Nebraska.

ALLEN, KEITH D., Professor of Pediatrics, B.A. 1980 Ohio; M.A. 1983 Michigan; Ph.D. 1987 West Virginia.

ANDERSON, JAMES R., Professor of Preventive and Societal Medicine and of Internal Medicine, B.A. 1973 SUNY (Buffalo), Ph.D. 1979 Washington.

ANDERSON, JOSEPH C., Professor of Radiology, B.S. 1963, M.S. 1966, M.D. 1968 Nebraska.

ANDERSON, REBECCA R., Assistant Professor or Preventive and Societal Medicine, J.D. 1978, M.S. 1986 Nebraska.

ANTONSON, DEAN L., Associate Professor of Pediatrics, B.A. 1970 Carleton College; M.D. 1974 Nebraska.

ARMITAGE, JAMES O., Professor of Internal Medicine and of Eppley Institute, B.S. 1969, M.D. 1973 Nebraska.

ASOJO, OLUWATOYIN A., Assistant Professor of Pathology and Microbiology, B.Sc. 1992, B.Sc 1993, Trenton University, Canada, Ph.D. 1999 University of Texas.


BARANOWSKA-KORTYLEWICZ, JANINA, Associate Professor of Radiation Oncology, of Internal Medicine and of Pathology and Microbiology, M.S. 1977 Polytech of Wroclaw; Ph.D. 1985 Kentucky.


BARNES, CAREN M., Professor of Surgical Specialties, B.S. 1973 Texas Woman's; M.S. 1974 Missouri-Kansas City.

BARNES-JOSIAH, DEBORA L., Assistant Professor of Pediatrics, B.S. 1980 Massachusetts Institute of Technology; M.S.P.H. 1986, Ph.D. 1989 North Carolina School of Public Health.

BARR, KATHLEEN, Associate Professor of Nursing, B.S.N. 1965 Creighton; M.S.N. 1982, Ph.D. 1994 Nebraska.

BARRON, CECILIA, Associate Professor of Nursing, B.S.N. 1966 Georgetown; M.Ed. 1969 Columbia; Ph.D. 1980 Ohio State.

BASTOLA, Dhundy R., Assistant Professor of Pediatrics, Ph.D. 1994 University of New Hampshire.

BATRA, SURINDER KUMAR, Professor of Biochemistry and Molecular Biology, of Eppley Institute, and of Pathology and Microbiology, B.Sc. 1976 G.M.N. College (INDIA); M.Sc. 1978, Ph.D. 1983 N.D.R.I. Karnal (INDIA).

BATRAKOVA, ELENA V., Research Assistant Professor of Pharmaceutical Sciences, M.Sc. 1983, Ph.D. 1987 Moscow State (Russia).

BAVITZ, J. BRUCE, Professor of Surgical Specialties, D.M.D. 1984 Pennsylvania.

BAXTER, B. TIMOTHY, Professor of Surgery and of Genetics, Cell Biology and Anatomy, B.S. 1978 Colorado State; M.D. 1982 Colorado.

BAYLES, KENNETH W., Associate Professor of Pathology and Microbiology, B.S. 1984, Ph.D. 1989 Kansas State University.

BEATTY, MARK W., Associate Professor of Adult Restorative Dentistry, and Assistant Professor of Oral Biology and of Otolaryngology–Head and Neck Surgery, D.D.S. 1981 Iowa; M.S.E. 1987 Purdue; M.S. 1991 Indiana.


BENNETT, GREGORY D., Associate Professor of Genetics, Cell Biology and Anatomy, B.S. 1982 California State, Hayward; Ph.D. 1988 Washington State.
BENNION, ROBERT G., Assistant Professor of Internal Medicine and of Pharmacology, B.A. 1985 Hastings; Ph.D. 1998 Nebraska.

BERGER, ANN M., Associate Professor of Nursing, B.S.N. 1971 Creighton; M.S.N. 1984, Ph.D. 1996 Nebraska.

BERNDT, WILLIAM O., Professor of Pharmacology, B.S. 1954 Creighton; Ph.D. 1959 SUNY (Buffalo).

BESSHO, TADAYOSHI, Assistant Professor of Biochemistry and Molecular Biology, B.A. 1986, M. Pharm. Sci. 1988, Ph.D. 1991 Okayama (Japan).

BIDASEE, KESHERE, Associate Professor of Pharmacology, B.Sc. 1986, Ph.D. 1991 West Indies.

BIERMAN, PHILIP J., Associate Professor of Internal Medicine, B.A. 1977, M.D. 1979 Missouri.

BILEK, LAURA D., Assistant Professor of Physical Therapy Education, B.S.P.T. 1988, Ph.D. 1994 Nebraska.

BINHAMMER, ROBERT T., Professor of Genetics, Cell Biology and Anatomy, B.A. 1951 Kalamazoo College; M.A. 1953, Ph.D. 1955 Texas.

BLACK, JOYCE M., Associate Professor of Nursing, B.S.N. 1978 Winona State; M.S.N. 1981, Ph.D. 1999 Nebraska.

BOCIEK, R. GREGORY, Assistant Professor of Internal Medicine, M.D. 1988 Ottawa (Canada).

BOLAM, DAVID L., Associate Professor of Pediatrics, B.S. 1965 Creighton; M.D. 1970 Nebraska.

BOOTH, S. JAMES, Associate Professor of Pathology and Microbiology, B.A. 1968 Iowa; Ph.D. 1975 Nebraska.

BORGSTAHL-KRAMER, GLORIA E. O., Associate Professor of Epplley, of Biochemistry and Molecular Biology, and of Pharmaceutical Sciences, B.S.E. 1985, Ph.D. 1992 Iowa.

BOSKA, MICHAEL D., Associate Professor of Radiology and Associate Professor of Radiation Science Technology Education, and of Pathology and Microbiology, B.S. 1980 Michigan State; Ph.D. 1985 California-Berkeley.

BRIDGE, JULIA ANN, Professor of Pathology and Microbiology, of Pediatrics, and of Orthopaedic Surgery, B.S. 1984; M.D. 1984 Nebraska.

BRONICH, TATIANA K., Associate Professor of Pharmaceutical Sciences, M.Sc. 1979, Ph.D. 1985 M.V. Lomonosov Moscow State (Russia).

BROWN, DAVID G., Professor of Oral Biology, B.Sc. 1965 McMaster (Canada); Ph.D. 1970 Colorado.

BUCHANAN, LYNNE M., Assistant Professor of Nursing, B.S.N. 1979, M.S.N. 1983 Nebraska; Ph.D. 1989 Washington.

BUEHLER, BRUCE A., Professor of Pediatrics, of Pathology and Microbiology, of Growth and Development, and of Epplley Institute B.S. 1966, M.D. 1970 Florida.

BURKE, WILLIAM J., Professor of Psychiatry, B.S. 1976, M.D. 1980 Nebraska.

BURNFIELD, Judith J., Adjunct Assistant Professor, B.S. 1986 SUNY at Buffalo (NY), Ph.D. 2003 California.

BYLUND, DAVID B., Professor of Pharmacology, B.S. 1970 Brigham Young; Ph.D. 1974 California (Davis).

CAMPBELL, JAMES R., Professor of Internal Medicine, B.S. 1968 Rochester (NY), M.D. 1976 Nebraska.

CAMPBELL-GROSSMAN, CHRISTIE, Assistant Professor of Nursing, BSN 1980, MSN 1983, Ph.D. 1996 Nebraska.

CAPLAN, STEVE H., Assistant Professor of Biochemistry and Molecular Biology and of Epplley Institute, B.S. 1989, M.S. 1992, Ph.D. 1998 Hebrew (Jerusalem).

CARLSON, MARK A., Assistant Professor of Surgery, B.A. 1984 Wooster (OH); M.D. 1989 Case Western Reserve.

CARMINES, PAMELA K., Professor of Cellular and Integrative Physiology, B.S. 1977 Longwood College (VA); Ph.D. 1982 Indiana.

CARSON, STEVEN D., Professor of Pathology and Microbiology, B.A. 1973 Rice; Ph.D. 1978 Texas (Galveston).

CASALE, GEORGE P., Associate Professor of Surgery, A.B. 1965 Providence College; Ph.D. 1972 University of Notre Dame.

CASEY, CAROL A., Professor of Internal Medicine and of Biochemistry and Molecular Biology, B.A. 1976 Augustana College; M.S. 1978, Ph.D. 1980 Rice.
CAVALIERI, ERCOLE, Professor of Eppeley Institute, of Biochemistry and Molecular Biology, and of Pharmaceutical Sciences, M.S. 1955 Liceo Scientifico Leonardo Da Vinci (Milan); D.Sc. 1962 Milan.

CHAKRAVARTI, DHURABAYOTI, Research Assistant Professor of Eppeley Institute, B.Sc. 1979 R.K. Mission Residential College (India); M.Sc. 1981, Ph.D. 1990 Calcutta (India).

CHAN, WING C., Professor of Pathology and Microbiology, M.B.,B.S. 1973, M.D. 1987 Hong Kong.

CHANNEY, WILLIAM G., Associate Professor of Biochemistry and Molecular Biology and of Eppeley Institute, B.S. 1972 Purdue; Ph.D. 1979 Michigan.

CHAPIN, JAMES W., Professor of Anesthesiology, B.S. 1969, M.D. 1972 Nebraska.

CHAPMAN, NORA M., Associate Professor of Pathology and Microbiology, B.A. 1975 California; Ph.D. 1981 Harvard.

CHEN, LI-WU, Assistant Professor of Preventive and Societal Medicine, B.P.H. 1990 National Taiwan; M.H.S.A. 1993 Michigan; Ph.D. 1999 Pennsylvania State.

CHENG, PI-WAN, Professor of Biochemistry and Molecular Biology, of Pharmaceutical Sciences, and of Eppeley Institute, B.S. 1965, M.S. 1968 National Taiwan; Ph.D. 1975 Case Western Reserve.

CHRISTMAN, JUDITH K., Professor of Biochemistry and Molecular Biology, A.B. 1962 New York, Ph.D. 1967 Columbia.

CIBOROWSKI, PAWEŁ S., Assistant Professor of Biochemistry and Molecular Biology, M.S. 1977 Warsaw (Poland); Ph.D. 1983 National Institute of Hygiene (Poland).

CLEMENS, DAHN L., Associate Professor of Internal Medicine and of Pathology and Microbiology, B.A. 1979 St. Mary's (MN); M.S. 1984 Idaho State; Ph.D. 1989 Colorado State.

COHEN, SAMUEL M., Professor of Pathology and Microbiology and of Eppeley Institute, B.S. 1967, M.D. 1972; Ph.D. 1972 Wisconsin.

COLOMBO, JOHN L., Professor of Pediatrics, B.A. 1971, M.D. 1975 Nebraska.

CORNISH, KURTIS G., Associate Professor of Cellular and Integrative Physiology, B.S. 1971, M.S. 1973 Brigham Young; Ph.D. 1977 Wake Forest.


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