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# CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Calendar</td>
<td>2</td>
</tr>
<tr>
<td>Map: University of Arizona Health Sciences Center</td>
<td>6</td>
</tr>
<tr>
<td>The University of Arizona</td>
<td>7</td>
</tr>
<tr>
<td>The College of Medicine</td>
<td>8</td>
</tr>
<tr>
<td>Physical Facilities</td>
<td>8</td>
</tr>
<tr>
<td>Educational Philosophy and Curriculum</td>
<td>11</td>
</tr>
<tr>
<td>Student Research Opportunities</td>
<td>14</td>
</tr>
<tr>
<td>Graduate Education</td>
<td>14</td>
</tr>
<tr>
<td>Postgraduate Education</td>
<td>15</td>
</tr>
<tr>
<td>Curriculum Outline</td>
<td>16</td>
</tr>
<tr>
<td>Admissions</td>
<td>18</td>
</tr>
<tr>
<td>Admission to the First-Year Class</td>
<td>18</td>
</tr>
<tr>
<td>Admission Process</td>
<td>20</td>
</tr>
<tr>
<td>Minority Applicants</td>
<td>22</td>
</tr>
<tr>
<td>Rural Arizonans</td>
<td>22</td>
</tr>
<tr>
<td>Admission by Transfer</td>
<td>22</td>
</tr>
<tr>
<td>List of Important Addresses</td>
<td>24</td>
</tr>
<tr>
<td>Student Affairs</td>
<td>25</td>
</tr>
<tr>
<td>Orientation</td>
<td>25</td>
</tr>
<tr>
<td>Housing</td>
<td>25</td>
</tr>
<tr>
<td>Student Health Service</td>
<td>26</td>
</tr>
<tr>
<td>The Code of Scholastic Conduct</td>
<td>26</td>
</tr>
<tr>
<td>Counseling and Advising</td>
<td>26</td>
</tr>
<tr>
<td>Advisory Council</td>
<td>26</td>
</tr>
<tr>
<td>Student Representatives</td>
<td>27</td>
</tr>
<tr>
<td>Financial Information</td>
<td>28</td>
</tr>
<tr>
<td>Expenses</td>
<td>28</td>
</tr>
<tr>
<td>Financial Assistance</td>
<td>28</td>
</tr>
<tr>
<td>Student Progress</td>
<td>32</td>
</tr>
<tr>
<td>General</td>
<td>32</td>
</tr>
<tr>
<td>Evaluation System</td>
<td>32</td>
</tr>
<tr>
<td>Student Progress Guidelines</td>
<td>33</td>
</tr>
<tr>
<td>Appeals</td>
<td>34</td>
</tr>
<tr>
<td>Key to Course Listings</td>
<td>35</td>
</tr>
<tr>
<td>Key to Symbols</td>
<td>37</td>
</tr>
<tr>
<td>Interdepartmental Courses</td>
<td>38</td>
</tr>
<tr>
<td>Departmental Courses</td>
<td>39</td>
</tr>
<tr>
<td>Divisions</td>
<td>84</td>
</tr>
<tr>
<td>The Arizona Board of Regents</td>
<td>92</td>
</tr>
<tr>
<td>Officers of the University</td>
<td>93</td>
</tr>
<tr>
<td>Recipients of Faculty Teaching Awards</td>
<td>94</td>
</tr>
<tr>
<td>College of Medicine Faculty</td>
<td>95</td>
</tr>
<tr>
<td>Administration</td>
<td>95</td>
</tr>
<tr>
<td>Faculty</td>
<td>97</td>
</tr>
<tr>
<td>College of Medicine Committees</td>
<td>152</td>
</tr>
<tr>
<td>Residents 1988-89</td>
<td>159</td>
</tr>
<tr>
<td>Residency Appointments, Class of 1988</td>
<td>172</td>
</tr>
<tr>
<td>Student Roster</td>
<td>176</td>
</tr>
<tr>
<td>Index</td>
<td>180</td>
</tr>
</tbody>
</table>
MEDICAL SCHOOL ACADEMIC CALENDAR 1988-1989
(TENTATIVE)

Year I

Orientation ............................................. Wednesday, July 27-Saturday, July 30, 1988
Classes Begin ........................................... Monday, August 1, 1988
Last Day of Registration .............................. Friday, September 2, 1988
Labor Day (holiday) ..................................... Monday, September 5, 1988
Year I Retreat ........................................... Wednesday, September 28, 1988
Fall Recess .............................................. Thursday, September 29-Sunday, October 2, 1988
Veterans’ Day (holiday) ............................... Friday, November 11, 1988
Thanksgiving Day (holiday) ......................... Thursday, November 24-Sunday, November 27, 1988
Winter Recess ........................................... Wednesday, December 21, 1988-Monday, January 2, 1989
Classes Resume ......................................... Tuesday, January 3, 1989
Last Day of Registration .............................. Thursday, January 19, 1989
President's Day (holiday) ............................. Monday, February 20, 1989
Spring Recess ........................................... Saturday, March 11-Sunday, March 19, 1989
Memorial Day (holiday) ............................... Monday, May 29, 1989
End of Year I ............................................ Wednesday, May 31, 1989
Summer Vacation ....................................... Thursday, June 1-Sunday, July 30, 1989

Year II

Classes Begin ........................................... Monday, August 1, 1988
Last Day of Registration .............................. Friday, September 2, 1988
Labor Day (holiday) ..................................... Monday, September 5, 1988
Fall Recess .............................................. Saturday, September 24-Sunday, October 2, 1988
Veterans’ Day (holiday) ............................... Friday, November 11, 1988
Thanksgiving Day (holiday) ......................... Thursday, November 24-Sunday, November 27, 1988
Winter Recess ........................................... Saturday, December 17, 1988-Monday, January 2, 1989
Classes Resume ......................................... Tuesday, January 3, 1989
Last Day of Registration .............................. Thursday, January 19, 1989
President's Day (holiday) ............................. Monday, February 20, 1989
Spring Recess ........................................... Saturday, March 11-Sunday, March 19, 1989
End of Basic Science Classes ....................... Friday, May 5, 1989
NBME Board Study ..................................... Saturday, May 6-Monday, June 12, 1989
Memorial Day (holiday) ................................ Monday, May 29, 1989
NBME, Part I ............................................. Tuesday, June 13-Wednesday, June 14, 1989
Summer Vacation ....................................... Thursday, June 15-Sunday, June 18, 1989
MEDICAL SCHOOL ACADEMIC CALENDAR 1988-1989
(TENTATIVE)

Year III

Classes Begin ......................................................... Monday, June 20, 1988
Period 1 ................................................................. Monday, June 20-Saturday, July 30, 1988
Independence Day (holiday) ........................................... Monday, July 4, 1988
Period 2 ................................................................. Monday, August 1-Saturday, September 10, 1988
Last Day of Registration ............................................. Friday, September 2, 1988
Labor Day (holiday) ..................................................... Monday, September 5, 1988
NBME, Part I (repeat) .................................................. Wednesday, September 7-Thursday, September 8, 1988
Period 3 ................................................................. Monday, September 12-Saturday, October 22, 1988
Period 4 ................................................................. Monday, October 24-Saturday, December 3, 1988
Veterans’ Day (holiday) ............................................... Friday, November 11, 1988
Thanksgiving Day (holiday) ........................................... Thursday, November 24-Sunday, November 27, 1988
Period 5 ................................................................. Monday, December 5, 1988-Saturday, January 28, 1989
Winter Recess ........................................................... Wednesday, December 21, 1988-Monday, January 2, 1989
Last Day of Registration .............................................. Thursday, January 19, 1989
Period 6 ................................................................. Monday, January 30-Saturday, March 11, 1989
President's Day (holiday) .............................................. Monday, February 20, 1989
Spring Recess ........................................................... Saturday, March 11-Sunday, March 19, 1989
Period 7 ................................................................. Monday, March 27-Saturday, May 6, 1989
Period 8 ................................................................. Monday, May 8-Saturday, June 17, 1989
Memorial Day (holiday) ............................................... Monday, May 29, 1989

Year IV

Classes Begin ......................................................... Monday, June 20, 1988
Independence Day (holiday) ........................................... Monday, July 4, 1988
Last Day of Registration ............................................. Friday, September 2, 1988
Labor Day (holiday) ..................................................... Monday, September 5, 1988
NBME, Part II ........................................................... Wednesday, September 28-Thursday, September 29, 1988
Veterans’ Day (holiday) ............................................... Friday, November 11, 1988
Thanksgiving Day (holiday) ........................................... Thursday, November 24-Sunday, November 27, 1988
Winter Recess ........................................................... Wednesday, December 21, 1988-Monday, January 2, 1989
President’s Day (holiday) .............................................. Monday, February 20, 1989
NBME, Part II (repeat) ................................................ Tuesday, April 4-Wednesday, April 5, 1989
Convocation ............................................................. Friday, May 12, 1989
Graduation .............................................................. Saturday, May 13, 1989

Elective Periods ...................................................... See Electives Manual

*Year IV Students do not have Spring Recess. They may, however, schedule vacations as explained in the text of the Electives Manual available in the Office of Student Records.
MEDICAL SCHOOL ACADEMIC CALENDAR 1989-1990
(TENTATIVE)

Year I

Orientation ........................................... Thursday, July 27-Friday, July 28, 1989
Classes Begin ......................................... Monday, July 31, 1989
Last Day of Registration ............................. Friday, September 1, 1989
Labor Day (holiday) .................................. Monday, September 4, 1989
Fall Recess ............................................. Thursday, September 28-Sunday, October 1, 1989
Veterans’ Day (holiday) ............................... Friday, November 10, 1989
Thanksgiving Day (holiday) ......................... Thursday, November 23-Sunday, November 26, 1989
Winter Recess ......................................... Wednesday, December 20, 1989-Sunday, January 7, 1990
Classes Resume ........................................ Monday, January 8, 1990
Last Day of Registration ............................. Thursday, January 18, 1990
President’s Day (holiday) ............................. Monday, February 19, 1990
Spring Recess ........................................... Saturday, March 10-Sunday, March 18, 1990
Memorial Day (holiday) ............................... Monday, May 28, 1990
End of Year I ........................................... Wednesday, May 30, 1990
Summer Vacation ....................................... Thursday, May 31-Sunday, July 29, 1990

Year II

Classes Begin .......................................... Monday, July 31, 1989
Last Day of Registration ............................. Friday, September 1, 1989
Labor Day (holiday) .................................. Monday, September 4, 1989
Fall Recess ............................................. Saturday, September 23-Sunday, October 1, 1989
Veterans’ Day (holiday) ............................... Friday, November 10, 1989
Thanksgiving Day (holiday) ......................... Thursday, November 23-Sunday, November 26, 1989
Winter Recess ........................................... Saturday, December 16, 1989-Sunday, January 7, 1990
Classes Resume ........................................ Monday, January 8, 1990
Last Day of Registration ............................. Thursday, January 18, 1990
President’s Day (holiday) ............................. Monday, February 19, 1990
Spring Recess ........................................... Saturday, March 10-Sunday, March 18, 1990
End of Basic Science Classes ........................ Friday, May 11, 1990
NBME Board Study ..................................... Saturday, May 5-Monday, June 11, 1990
Memorial Day (holiday) ............................... Monday, May 28, 1990
NBME, Part I ............................................. Tuesday, June 12-Wednesday, June 13, 1990
Summer Vacation ....................................... Thursday, June 14-Sunday, June 17, 1990
MEDICAL SCHOOL ACADEMIC CALENDAR 1989-1990
(TENTATIVE)

Year III

Classes Begin .......................................................... Monday, June 19, 1989
Period 1 ................................................................. Monday, June 19-Saturday, July 29, 1989
Independence Day (holiday) ........................................... Tuesday, July 4, 1989
Last Day of Registration ............................................... Friday, September 1, 1989
Labor Day (holiday) ..................................................... Monday, September 4, 1989
Period 2 ................................................................. Monday, July 31-Saturday, September 2, 1989
NBME, Part I (repeat) .................................................. Wednesday, September 6-Thursday, September 7, 1989
Period 3 ................................................................. Monday, September 11-Saturday, October 21, 1989
Period 4 ................................................................. Monday, October 23-Saturday, December 2, 1989
Veterans’ Day (holiday) ................................................ Friday, November 10, 1989
Thanksgiving Day (holiday) .......................................... Thursday, November 23, 1989
Period 5 ................................................................. Monday, December 4, 1989-Saturday, January 27, 1990
Winter Recess ............................................................ Saturday, December 23, 1989-Sunday, January 7, 1990
Last Day of Registration ............................................... Thursday, January 18, 1990
Period 6 ................................................................. Monday, January 29-Saturday, March 10, 1990
President’s Day (holiday) .............................................. Monday, February 19, 1990
Spring Recess ............................................................. Saturday, March 10-Sunday, March 25, 1990
Period 7 ................................................................. Monday, March 26-Saturday, May 7, 1990
Period 8 ................................................................. Monday, May 7-Saturday, June 16, 1990
Memorial Day (holiday) ................................................ Monday, May 28, 1990

Year IV*

Classes Begin .......................................................... Monday, June 19, 1989
Independence Day (holiday) ........................................... Tuesday, July 4, 1989
Last Day of Registration ............................................... Friday, September 1, 1989
Labor Day (holiday) ..................................................... Monday, September 4, 1989
NBME, Part II ............................................................ Tuesday, September 26-Wednesday, September 27, 1989
Veterans’ Day (holiday) ................................................ Friday, November 10, 1989
Thanksgiving Day (holiday) .......................................... Thursday, November 23, 1989
Winter Recess ............................................................ Saturday, December 23, 1989-Sunday, January 7, 1990
Last Day of Registration ............................................... Thursday, January 18, 1990
President’s Day (holiday) .............................................. Monday, February 19, 1990
NBME, Part II (repeat) ................................................. Tuesday, April 3-Wednesday, April 4, 1990
Convocation ............................................................... Friday, May 11, 1990
Graduation ................................................................. Saturday, May 12, 1990

Elective Periods .......................................................... See Electives Manual

*Year IV Students do not have Spring Recess. They may, however, schedule vacations as explained in the text of the Electives Manual available in the Office of Student Records.
1. College of Medicine
2. Cancer Center
3. College of Nursing
4. College of Pharmacy
5. South Entrance
6. Main Entrance (2nd floor)
7. Children’s Research Center
8. Life Sciences Building
9. Magnetic Resonance Imaging Building
THE UNIVERSITY OF ARIZONA

The University of Arizona is one of three publicly-supported institutions of higher learning in Arizona under the jurisdiction of the Arizona Board of Regents. It was established in 1885 as a land grant institution 27 years before Arizona was admitted to the Union as the 48th state. During its colorful history it has developed into one of the great universities of the southwestern United States with 10 colleges, four faculties, six schools, 110 academic committees or departments, and 43 research and special service units.

Commensurate with the rapid growth of the state during the past two decades, the University has grown to its present enrollment of more than 31,430 full- and part-time students, 6,700 of whom are enrolled in graduate studies. The bachelor's degree is offered in 131 programs, the master's degree in 119, and the doctorate in 91, plus other degrees available in nine fields. The University offers nearly 400 fields of study. Its more than 130,000 active alumni are represented in every community in Arizona, all of the United States, and in many foreign countries.

The University is located about one mile from the downtown area in Tucson—the center of a rapidly growing metropolitan area with a population of more than 650,000.
In 1962, the Arizona Board of Regents granted authorization to the University of Arizona to develop a College of Medicine. Ground was broken in May 1966 for the Basic Sciences Building which was completed in September 1967 and occupied that same month by the 32 students of the first class.

A second class of 32 students entered the College in the fall of 1968, and the first full class of 64 students was enrolled in September 1969. In May 1971, the M.D. degree was granted to the members of the first graduating class and to date more than 1,000 students have been graduated. Since 1976 the size of the entering class has been 88 students. The College of Medicine presently has an enrollment of more than 350 full-time medical students.

Through the sale of self-liquidating bonds and additional matching funds from the United States Public Health Services, planning was completed for the Clinical Sciences Building and 275-bed University Hospital (now called University Medical Center). Construction was begun in the summer of 1968 and completed in July 1971.

Physical Facilities

The University of Arizona Health Sciences Center complex consists of five interconnected buildings, and adjoining structures, on a 30 acre site just north of the main campus. These consist of the Basic Sciences Building, the Clinical Sciences Building, Outpatient Clinics, University Medical Center, and the Arizona Cancer Center, all interconnected. The Family Practice Center, Temporary Office and Laboratory Buildings, the Dermatology unit, the Radiology Research Building and the Office of Medical Education are housed in adjacent buildings. Planned for construction in the near future are the Life Sciences Building, a Children’s Research Center, a Heart Center, a parking structure and additional office and laboratory space. The Colleges of Nursing and Pharmacy are located just South of the Basic Sciences Building.
A student wing of the Basic Sciences Building houses the multidisciplinary laboratories, lecture rooms, conference rooms, student lounge, and support facilities. Centralized animal quarters, administrative services and part or all of the seven basic science departments are also housed in this building.

Library

The Arizona Health Sciences Center Library was one of the earliest units planned for the College of Medicine, opening its doors in September 1967 when the first class began studies. Currently spanning and serving the entire Health Sciences Center, the library occupies
32,000 sq. ft. and maintains a collection of 155,000 volumes, 3,400 media programs and subscribes to 3,600 journals. It is open 24 hours every day, except Christmas and New Year's Day.

The library is a member of the nationwide medical library network founded by the National Library of Medicine and serves as the designated resource library for Arizona through the Pacific Southwest Regional Medical Library Service. Its resources are available not only to students and faculty of the University, but also to health care providers throughout Arizona.

Reference librarians are available to provide assistance in using the resources of the library effectively, consult with library users to solve complex information queries, formulate and perform computerized literature searches and locate factual information. Sessions on medical bibliography and information retrieval are offered in the College of Medicine curriculum. The Field Office provides similar services to library users outside the Tucson area and consultation services to hospital libraries.

The services of the library are many and most are computer enhanced. The catalog to the collection is online, allowing users to search for material in a variety of ways with a greater degree of specificity. Databases encompassing the journal literature are available for use by library users themselves or through the expertise of a reference librarian. A wide assortment of audiovisual titles in various formats (audiotapes, videotapes, videodiscs, slide/sound programs, slides and models) and eight study carrels, especially equipped to accommodate these formats, are also available. Electronic links with other libraries are maintained so that material not available locally can be obtained quickly for library users. Finally, the library houses the Microcomputer Learning Center, operated by the Office of Medical Education, and the Arizona Poison and Drug Information Center, administered by the College of Pharmacy.

Clinical Facilities

University Medical Center is the primary medical center for the education of medical students, but other settings are also utilized. University Medical Center (UMC) is a private, non-profit institution with a separate Board of Directors. UMC operates under a lease arrangement with the Arizona Board of Regents which guarantees that the educational, service and research missions of the Colleges of Medicine, Pharmacy and Nursing will not be compromised. UMC's management structure is designed to meet the modern financing and practice methods in the medical care system.

UMC is a 300 bed hospital, originally built in 1971, with many units which have undergone renovation in recent years. Modern in-patient units, an extensive outpatient facility and support services are contained within the Clinical Sciences Building. The Arizona Cancer Center was opened in 1986 and is a modern multidisciplinary facility for patient-care, teaching and research in cancer and related disorders. UMC contains the only lithotripsy unit in Tucson, a magnetic resonance imaging facility, and other modern diagnostic and therapeutic modalities.

Portions of the educational program are conducted at other health care facilities, including: Tucson Veterans Administration Hospital, Tucson Medical Center, Kino Community Hospital, Palo Verde Hospital, Crippled Children's Clinic, El Rio - Santa Cruz Neighborhood Health Center, other Tucson hospitals and clinics. In addition, health care facilities in many of Arizona's counties are used, in part, for educational rotations for medical students. In Phoenix, regularly conducted clerkships and elective activities are carried out at: Maricopa Medical Center, Phoenix Children's Hospital, Good Samaritan Medical Center, St. Joseph's Hospital and Medical Center, Phoenix Veterans Administration Medical Center, Barrow Neurological Institute, and other hospitals and health care facilities. Faculty of the College of Medicine conduct all educational experiences, both at UMC and all other sites.
Educational Philosophy and Curriculum

The curriculum of the College of Medicine is determined by the faculty with consideration given to student evaluations, evaluations conducted at regular intervals, and national needs and priorities. It is not a static program, but is altered as is appropriate, after adequate study and reflection, to match the changing and educational needs of students. The overall purpose of the educational program is to provide our students with the capacity to learn medicine for the rest of their professional careers. This is accomplished by supplying them the opportunity to learn what is currently known and unknown; with study habits which permit continuous acquisition of new knowledge and modification of formerly acquired information; with skills to conduct patient care activities and with professional attitudes consonant with their charge to care for those persons for whom they provide preventive and curative advice and treatment.

Biologic, cultural, psychosocial, economic, and sociologic concepts and data are provided in the core curriculum. Students are encouraged to add to this core by their continuous clinical experiences. Increasing emphasis is placed on problem-solving ability, beginning with initial instruction and carried through to graduation. Excellence in performance is encouraged and facilitated. Awareness of the milieu in which medicine is practiced is also encouraged. The core curriculum comprises three years of required studies and one year of elective rotations. Half of the curriculum deals with the basic sciences critical to modern medical understanding and practice, and the other half to practical, patient-contact, clinical science instruction.

The learning environment encompasses lectures, small group instruction, independent study, clinical clerkships, practicums in physical diagnosis, computer-based instruction and a variety of other modes for the learner. Students learn in the classroom, conference room, laboratory, clinic and physician's office, bed units of hospitals, special sites for diagnostic and therapeutic maneuvers, University Medical Center and a rich variety of community inpatient and outpatient settings. The elective portion of the curriculum permits experiences within and beyond the above described educational system, to include programs abroad as well as
those closer to home. Students are encouraged to learn from individual patient contacts, from family settings, from groups as small as neighborhoods to communities as large as the state of Arizona. Exposure is available to individual physicians in a one-to-one relationship, to groups of physicians, to large health maintenance organizations, to public health facilities and other governmental health care systems.

Full-time faculty, which includes primary and specialty care physicians and scientists, community physicians, and resident physicians in a variety of health care delivery models, comprise the faculty which facilitates student learning. The concept of the physician as an integral part of a complex health care delivery team is emphasized in these clinical exposures.

Upon completion of the first four years of study, the graduate of our system is prepared to enter the next phase of medical education, the residency of his/her choice. Graduate medical education (residency training) is available in University of Arizona based programs in all of the traditional disciplines from primary care to the specialties. The faculty assists the students in applying for and successfully competing for residency programs in Arizona and throughout the United States. Our graduates have been praised by programs throughout the country for their preparation and professional attitudes. A number of graduates have become local practitioners in the State of Arizona and others have joined the faculty at the University of Arizona College of Medicine and other medical colleges.

Our graduates are also prepared to continue the process of life-long learning, having achieved a framework of knowledge and the tools to adapt that knowledge to practice, and to add to and modify it as the dynamic discipline of medicine adds to its core of concepts and information. Continuing educational programs are provided at the College and many of our alumni return to continue this process of education throughout their professional careers.

The Curriculum

ORIENTATION:

Orientation to the medical school is provided to each incoming class during several days prior to the start of the initial semester. Students are introduced to the educational philosophy of the College, to the curricular elements, to methods for achieving optimal learning, to basic
computer skills and to self-management skills. The advisory system, financial aid, student governance and other topics are also introduced at this orientation. An annual retreat is conducted approximately 8 weeks into the course work and is attended by all first year students and selected faculty and members of the administration.

BASIC SCIENCES:

During the first year, anatomy, biochemistry, physiology and neurosciences are taught in tandem with a course designed to introduce the student to clinical skills, Preparation for Clinical Medicine. To ensure that global and humanistic concerns are integrated into the phase in which biologic knowledge is being learned, the course on Human Behavior and Development begins in the spring semester and introduces a wide variety of broad topics that influence medical care and its delivery. Two additional courses are integrated into the basic science curriculum: Human Genetics and Embryology.

In the second year, the basic sciences of pathology, microbiology and pharmacology are introduced and more sophisticated experiences are provided in the Preparation for Clinical Medicine Course.

Computer instruction, initiated during orientation, is also enhanced by course work during the first year. In addition, various software medical educational packages are offered for self-instruction, evaluation, and as part of the regular curriculum.

This sequence in the first two years ensures that the biologic framework of the human body is grasped by the student and that this knowledge is placed into the whole of human medicine. The student learns the structure and function of the cells, tissues and organs in health and in disease, the influence that the environment has on the human organism, and the effect of medication and drugs. At the same time, the psychosocial influences are incorporated into this framework and the student begins the process of acquiring those skills and attitudes essential to the practice of medicine. All courses have non-lecture instructional units integrated into their allotted hours. These units are designed to encourage the student to exercise problem-solving abilities, analysis and critical thinking.

In addition to the required curricular elements, a wide variety of Enrichment Electives is offered each year. These electives are designed to augment student experiences. A list of such Enrichment Electives is published and distributed each year.

CLINICAL SCIENCES:

The third year of our curriculum is devoted to clinical clerkships, during which the student learns, under faculty supervision, by daily patient contact in the various disciplines of medicine. There are 48 weeks of required rotations as follows: Internal Medicine (12 weeks); Pediatrics (6 weeks); Obstetrics and Gynecology (6 weeks); Psychiatry (6 weeks); Family Medicine (6 weeks); General Surgery (6 weeks); Specialty Surgery (3 weeks); Neurology (3 weeks). The Specialty Surgery (3 weeks) may be taken in the fourth year, in which case the student can select an additional rotation of 3 weeks in length. For students who select the Specialty Surgery (3 weeks) rotation in the third year, at least 33 weeks of electives are required in the fourth year. For students taking the Specialty Surgery (3 weeks) in the fourth year, 30 weeks of electives are required in the fourth year.

The fourth year curriculum is comprised solely of elective rotations. This year is planned in concert with a faculty advisor taking into account the student's career goals, educational needs and preferences. Clinical and non-clinical electives are available in a wide variety of disciplines; available electives are published and distributed to students each year. Upon approval of the faculty advisor and the corresponding department at the College of Medicine, students can take up to 15 weeks of electives in approved programs outside of the College of Medicine.

As indicated earlier, facilities other than University Medical Center (UMC) are used in the educational programs. Students can expect that at least a portion of the required curriculum in the clinical years may take place outside of UMC, including sites outside of Tucson.

See pages 16-17 for the Outline of the Curriculum.
CURRICULUM POLICIES:

University policy expects students to be regular and punctual in class attendance and affirms that students themselves are primarily responsible for attendance. Each instructor will provide students with a written statement of his/her policy in respect to absences.

Students wishing to petition for exemption from basic science courses may do so by directing requests to the departments. Such requests will be considered on an individual basis according to departmental policies and will be granted only in exceptional cases. Students in the basic science portion of the curriculum may enroll in various elective courses for which they meet the prerequisites and as they have available time. These electives may be used to fulfill clinical science or elective year requirements with prior permission of the Curriculum Committee.

As part of their education, all students will be required to participate in laboratory experiments in which experimental animals will be used.

OFFICE OF MEDICAL EDUCATION:

The Office of Medical Education assists the faculty in all aspects of the medical education process. The range of educational assistance includes: course development; teaching effectiveness documentation; faculty teaching improvement; test development and scoring; medical education research; ongoing assessment of the college curriculum and its impact on students. The members of the Office contribute to the Curriculum Committee, curriculum subcommittees, and administrative educational committees. Members of this office are responsible for the computer-facility instruction for medical students and offer an Enrichment Elective in Medical Computing.

Student Research Opportunities

Students are encouraged to participate in research activities. Under a five-year grant from the National Institutes of Health, research experiences with stipends will be offered to qualified medical students. In addition, extracurricular experiences (i.e., course in research methodology, clinical research correlation seminars, a student research club and a research mentor-career advisor system) will be offered to such students. Student research is also funded through the Dean's Office in the form of summer stipends, supply monies and travel support to encourage students to present their results at scientific meetings.

Graduate Education

Basic Sciences

A formal program leading to the granting of the combined M.D./Ph.D. degrees is available. Students wishing to pursue studies leading to the combined degrees must first be admitted to the College of Medicine. They may then apply for acceptance into the following degree programs leading to the Ph.D.: Anatomy, Biochemistry, Microbiology and Immunology, Molecular and Cellular Biology, Pharmacology and Physiology. Both degrees are awarded concurrently. Ph.D. degrees in other disciplines may be arranged on an individual basis. Certain courses taken in the regular medical curriculum are applicable to the Ph.D. program requirements. The combined degree program usually requires a 6-7 year period for completion.

Residency Training

Specialty training in the clinical disciplines is provided by Anesthesiology, Dermatology, Emergency Medicine, Family Practice, General Surgery, Internal Medicine, Neurology, Nuclear Medicine, Obstetrics and Gynecology, Occupational Medicine, Ophthalmology, Orthopedics, Pathology, Pediatrics, Preventive Medicine, Psychiatry, Psychiatry-Child, Radiology Diagnostic, Radiology Therapeutic, Radiology with Special Competence in Nuclear
Radiology, Thoracic Surgery, Urology and Vascular Surgery. Further information concerning these programs may be obtained by contacting the program director in each instance.

Postgraduate Education

The Office of Medical Education serves as a central resource for the coordination, integration, facilitation, accreditation and evaluation of continuing medical education for the faculty and the physicians of Arizona and elsewhere. The goals and objectives of the continuing education program include supporting the continuing professional development of physicians by offering opportunities to enrich and extend their medical education.

Continuing Medical Education offerings are intended to communicate information about state-of-the-art medical practice primarily to physicians throughout Arizona and to disseminate to physicians elsewhere changes in medical practice resulting from research and development activities of the College of Medicine faculty.

For information on specific programs, please contact the Office of Medical Education, Continuing Education, University of Arizona College of Medicine, Tucson, Arizona, 85724, Telephone (602) 626-6707.

The Mini-Residency Program is a departmentally based program that provides educational experiences of one of several weeks in the academic setting of the College of Medicine for practicing physicians. An educational program utilizing conferences, rounds, appropriate elements of the undergraduate and graduate teaching programs, and patient care activities is designed to meet the expressed interests and educational needs of each physician. For information, please contact the appropriate clinical department.
I
Fall Semester
CURRICULUM OUTLINE
Basic Sciences

YEAR I

Fall Semester
GROSS ANATOMY
180 hours
including embryology
22 hours

Spring Semester
BIOCHEMISTRY
96 hours
or INTERMEDIATE BIOCHEMISTRY
88 hours
including genetics
20 hours

PREPARATION FOR CLINICAL MEDICINE (PCM)
including micro computing
55 hours

YEAR II

Fall Semester
PATHOLOGY
152 hours

Spring Semester
PATHOLOGY
157 hours

Physiology
227 hours

MICROBIOLOGY
123 hours

PHARMACOLOGY
100 hours

MICROANATOMY
83 hours

HUMAN BEHAVIOR AND DEVELOPMENT (HB & D)
80 hours

PCM
101.5 hours
plus three field trips
106 hours
110.5 hours

Fall Recess

Spring Recess

Orientation
Christmas/New Year's Recess
Two-Month Vacation
Christmas/New Year's Recess
Practice NBME Part 1

Important Events

Breaks
### CURRICULUM OUTLINE

#### Clinical Sciences

#### YEAR III

| Summer | CLINICAL CLERKSHIPS | 48 weeks required |

#### YEAR IV

| Summer | Late Spring | ELECTIVES | 33 weeks required |

> Of the 33 weeks required, 18 units must involve patient contact and 18 units must be supervised by College of Medicine faculty.

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>NUMBER OF OFFERINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANATOMY</td>
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</tr>
<tr>
<td>ANESTHESIOLOGY</td>
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<tr>
<td>BIOCHEMISTRY</td>
<td>2</td>
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<tr>
<td>FAMILY &amp; COMMUNITY MEDICINE</td>
<td>35</td>
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<tr>
<td>INTERNAL MEDICINE</td>
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</tr>
<tr>
<td>MICROBIOLOGY &amp; IMMUNOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>NEUROLOGY</td>
<td>6</td>
</tr>
<tr>
<td>OBSTETRICS/GYNECOLOGY</td>
<td>6</td>
</tr>
<tr>
<td>OPHTHALMOLOGY</td>
<td>3</td>
</tr>
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<td>PATHOLOGY</td>
<td>4</td>
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<tr>
<td>PEDIATRICS</td>
<td>25</td>
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<tr>
<td>PHARMACOLOGY</td>
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<tr>
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<tr>
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<tr>
<td>SURGERY</td>
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<td>SEMINARS</td>
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</table>

(See Electives Manual for course details)

<table>
<thead>
<tr>
<th>June</th>
<th>September</th>
<th>Spring Recess</th>
<th>September</th>
<th>Graduation</th>
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</thead>
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<tr>
<td>NBME Part I</td>
<td>NBME Retake</td>
<td>Christmas/New Year's Recess</td>
<td>NBME Retake</td>
<td>Christmas/New Year's Recess</td>
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<tr>
<td></td>
<td></td>
<td>April NBME Part II</td>
<td></td>
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</tbody>
</table>
ADMISSIONS

Admission to the First-Year Class

GENERAL: The University of Arizona College of Medicine follows the recommended application and acceptance procedures of the Association of American Medical Colleges (AAMC). These may be found in the most recent copy of the Medical School Admissions Requirements book, published annually by the AAMC. Everyone interested in attending medical school should consult this book, as it contains a great deal of useful information. The most recent copy may be obtained for $8.50 by writing to the AAMC (address on page 24).

Acceptance to the University of Arizona College of Medicine is based upon an assessment of the applicant's intellectual and personal traits, fulfillment of certain prerequisites outlined below, and consideration of the applicant's state of residence. All applicants who wish to be considered must be U.S. citizens or have permanent resident visas. Preference is given first to residents of Arizona and next to a few highly qualified applicants who are residents of Alaska, Montana and Wyoming, and are certified and will receive full and uninterrupted funding by the Western Interstate Commission for Higher Education (WICHE). Applicants from states other than these cannot be considered. In evaluating applicants, the Admissions Committee considers ability and scholarship as indicated by the entire academic record, the results of the Medical College Admission Test (MCAT), personal statement, college preprofessional committee evaluations, letters of recommendation, health related experience and personal interviews. Also considered is breadth of the undergraduate education, whether in the humanities, social sciences, natural sciences, etc. No preference is given to any particular kind of undergraduate major (see Admission Process).

PREREQUISITES: The College of Medicine encourages applications from all interested students irrespective of their college major. However, the following minimum requirements must be met prior to matriculation:

1. Applicants must successfully complete three full years of study (90 semester hours or 135 quarter hours) at an accredited college or university, including 30 semester hours (45 quarter hours) of upper division courses. Applicants educated outside the United States must have completed at least two years of study in an accredited college or university in the United States or Canada prior to application.

2. Applicants must successfully complete two full semesters (three quarters), or equivalent, in each of the following areas: general chemistry, organic chemistry, physics, general biology or zoology, and English.

3. Applicants are strongly urged to take the MCAT in the spring of the year of application and to have their premedical requirements completed at the time of application. The MCAT must have been taken no earlier than two years prior to application (April 1986) and no later than the fall prior to the year of anticipated entrance (September). Note: The University of Arizona College of Medicine is a participant in the MCAT Essay Pilot Project and may use the MCAT essays in making decisions about applicants (see Admission Process).

APPLICATION PROCEDURE: The University of Arizona College of Medicine participates in the American Medical College Application Service (AMCAS). Persons seeking admission to the entering class must process their applications through AMCAS, even if this
is the only school to which they apply. Those wishing to make application for the class entering in 1989 should follow the steps outlined below:

1. Arrange to take the Medical College Admission Test (MCAT), preferably in the Spring prior to application, by writing to the American College Testing Program (address on page 24).

BETWEEN JUNE 1 AND NOVEMBER 1, 1988

2. Obtain an AMCAS application packet. An application may be obtained either by using an AMCAS Application Request Card, available from any participating medical school or the AMCAS application packet itself which is available from most preprofessional advisors.

3. Complete and return the AMCAS application. Follow instructions in the application packet and return the completed application to the AMCAS office. (Please do not send this material to the medical school.) You must request that the registrar of every junior college, college and university you have attended forward official transcripts directly to the AMCAS office by November 1st. All transcripts should arrive before your application reaches the AMCAS office to eliminate any delay in processing your materials. In your instructions to AMCAS, you designate the medical schools to which you wish to apply and pay a fee based on the number of those schools. Even if you have previously applied to this school, or any other school under AMCAS, you must submit an entirely new application and transcripts each year.

4. Return AMCAS application by November 1, 1988. The deadline for your application to the University of Arizona College of Medicine is November 1, 1988. Your AMCAS application and all transcripts must be received in Washington by this date. Please allow sufficient time for mail delivery since applications received in Washington after this date cannot be considered by this college.

5. Await notification of receipt of application. You will receive notice first from AMCAS and later from this college that your application has been received. The AMCAS application constitutes the preliminary application to this College of Medicine.

6. Initial screening of applications. After an initial screening to determine your state residency, you will be notified as to the disposition of your preliminary application. Those who will not be considered further are notified as soon as possible so they may concentrate their efforts on other schools.

7. Receipt of supplementary materials. Those who pass the initial screening process will receive a packet of supplementary materials that are specific to the University of Arizona College of Medicine. Instructions are provided with the packet, and all materials should be returned directly to the Admissions Office, College of Medicine, University of Arizona, Tucson, Arizona, 85724. (Please do not send any of this material to AMCAS.)

8. Invitation to appear for personal interview. All applicants receiving supplementary materials will be invited to appear for a personal interview at the College of Medicine. All appointments are made by the Admissions Office. Since the personal interview is an integral part of the admission process, no applicant can be considered without it. At the time of the interview, you will have an opportunity to meet with a medical student and tour the Health Sciences Center. Interviews take place between October and January. Interviews are conducted over the Christmas holiday period primarily for those applicants attending schools outside Arizona. However, where travel to Tucson would result in an undue financial burden, it may be possible to arrange for interview summaries to be sent from other schools where the applicant has been interviewed. Such requests may be made at the time you are invited for your interview.

9. Notification that file is complete. After all your materials have been received and you have had your interview, you will be notified that your application is complete. The
Admissions Office will periodically review all files and notify you if any materials are still missing. However, we strongly recommend that you complete your file prior to December 31, 1988, since notification of Admissions Committee actions take place between January and March of 1989.

JANUARY 15 TO MARCH 15, 1989

10. Notification of action by the Admissions Committee. In early December 1988, the Admissions Committee will begin to take action on all applicants whose files are complete. Letters of acceptance will be sent on January 15, February 15 and March 15, 1989 (or the first working day thereafter). Notification of rejection or alternate status will be sent out on March 15, 1989.

11. Accepted applicants must submit a letter of intent within two weeks, to retain their place in the class. No deposit is required. Accepted students are encouraged to withdraw their application from medical schools of lower preference. Many well-qualified students are Alternates each year. It is the obligation of each accepted applicant to withdraw upon making a decision to go elsewhere, in order to give those not yet selected the opportunity to compete for a vacancy in the class.

AFTER MARCH 15, 1989

12. An applicant holding a position on the Alternate List may receive an acceptance at any time, if a place becomes available.

13. Final acceptance for enrollment for all accepted applicants is contingent upon a continued satisfactory level of academic and personal performance, completion of required course work prior to July 15, 1988, and all other requirements. Certified WICHE acceptees (Alaska, Montana, and Wyoming) must provide evidence of full and uninterrupted funding from their state of origin. Failure to meet these conditions will be cause for withdrawal of the acceptance.

14. Any student accepted for enrollment who wishes to be exempted from any medical school course may petition the appropriate department to be relieved of the necessity of taking the department's formal course. The decision rests with the individual department and is based on the merits of each request.

Admission Process

Applicants apply directly to the American Medical College Application Service (AMCAS). The application will be reproduced and sent to all the schools to which the applicant wishes to apply. When AMCAS applications are received at the College of Medicine, they undergo an initial screening. All Arizona residents are sent additional materials and invited for personal interviews. A few highly qualified WICHE certified and funded applicants from Alaska, Montana, and Wyoming, who have passed the initial screening, are sent additional materials and invited for a personal interview. All applicants who are residents of any other state are automatically sent a letter informing them they are not eligible. The deadline for applications is November 1, 1988.

The Admissions Committee uses five major criteria in the selection of students: academic record, Medical College Admission Test (MCAT) scores, personal statement, college preprofessional committee evaluations (or letters of recommendation), and results of personal interviews. Consideration of the academic record includes not only grades, but trends in the grade point average, course loads, work experience while going to school, breadth of the undergraduate education, extent of extracurricular interests and pursuits, and other factors which might directly or indirectly influence the individual's total academic performance. The MCAT scores provide a national comparison of each student with all those seeking admission to medical school. As part of the MCAT Essay Pilot Project, the Admissions Committee may include the MCAT essays in their selection decisions. Applicants are
asked to have letters of recommendation submitted from either a Preprofessional Committee at their university or from three individual faculty members. Use of the Committee at your school is very strongly recommended. If individual letters are submitted, they should be from two science faculty members and one non-science faculty member. All must be from professors under whom you have taken courses. Each applicant will be interviewed by three College of Medicine faculty members and one practicing physician. The four interviews are on a one-to-one basis. The interviewers are asked to evaluate the applicant's ability to relate to another individual in the interview situation and to ascertain, from the interview, their impression of the applicant's overall desirability as a future physician. The interviewers also attempt to gain some insight into the applicant's family background, outside interests, and the duration and depth of interest in medicine. The interviewers have no prior information about the applicant. They forward their impressions to the Admissions Committee, which has access to all other data.

The Admissions Committee reviews all completed applications. All facets of the record are considered. The amount of consideration given to the academic record, MCAT scores, MCAT essay, personal statement, preprofessional evaluation, or letters of recommendation, health related experience, and results of the personal interviews, depends on each individual on the Committee. At Admissions Committee meetings, each applicant's file is reviewed and discussed by the members of the Committee. The vote of the Committee determines who is accepted. Acceptances are based on the evaluation by the members of the Admissions Committee regarding each applicant and the relationship of each applicant to every other applicant. In this way, an attempt is made to be as fair as possible to all persons applying to medical school by utilizing all the information available to the Committee.

The Committee selects sufficient applicants for acceptance to fill the class and a reasonable number to be placed on the Alternate List. All other applicants are notified that their applications are not competitive and, therefore, they are no longer under consideration.
Minority Applicants

The College of Medicine has an active program dedicated to the recruitment, admission, education, and graduation of an increased number of individuals from ethnic minority groups. Faculty members participate in all aspects of the program.

Rural Arizonans

Special consideration will be given to individuals who have lived half their lives in rural Arizona communities outside the state's major metropolitan areas and who desire to return to such an area to practice medicine. A form requesting this special consideration will be included with the supplementary materials.

Admission by Transfer

Applications for transfer to the College of Medicine are welcomed from students who satisfy the conditions outlined below. Applicants are treated as competitors for any available places. Positions become available only through attrition.

1. Applications will be considered from residents of the several states in the following order of preference:
   a. Arizona residents matriculated in foreign medical schools (WHO-listed).
   b. Residents of Alaska, Montana and Wyoming (who are WICHE certified and will receive full and uninterrupted funding) matriculated in foreign medical schools (WHO-listed).
   c. Arizona residents matriculated in four-year U.S. medical schools or U.S. schools of osteopathy.

2. Applicants must meet the following academic criteria:
   a. Applicants must successfully complete three full years of study (90 semester hours or 135 quarter hours) at an accredited college or university, including 30 semester hours (45 quarter hours) of upper division courses. Applicants educated outside the United States must have completed at least one year of study in an accredited college or university in the United States prior to application.
   b. Applicants must successfully complete two full semesters (three quarters), or equivalent, in each of the following areas: general chemistry, organic chemistry, physics, general biology or zoology, and English.
   c. Must have taken the MCAT.
   d. Must have completed all of the basic sciences as a matriculant in a LCME accredited U.S. or Canadian, osteopathic, or WHO-listed foreign medical school and provide evidence (an official transcript is required) of having successfully completed a course of study which includes the content of the following courses: anatomy, biochemistry, microbiology, pathology, pharmacology, physiology, and behavioral sciences.

3. Where adequate training in history-taking and physical examination is not apparent from the applicant's record, at the discretion of the Admissions Committee, the applicant will be required to participate in an especially prepared course of study in these areas.

4. Applicants whose credentials indicate deficiencies in other areas of study covered during the basic science curriculum will be held responsible for this material through self-study and will be expected to perform at the same level as the students who have completed the first two years here at the University of Arizona College of Medicine.

5. All applicants matriculated in non-LCME accredited medical schools must take the Medical Sciences Knowledge Profile (MSKP) examination prior to being considered by the Admissions Committee. Please contact the AAMC for registration materials and deadlines (see page 24 for address). Applicants who are enrolled in LCME accredited medical schools must take Part I of the National Board Examination.
6. Applicants who are on an official leave of absence of not more than one year will be considered. A letter substantiating this leave must be submitted from the applicant's medical school.

7. All accepted transfers will be required to take Parts I and II of National Boards in order to graduate.

8. All applicants who meet the listed criteria and are under consideration will be interviewed at the College of Medicine.

9. All applicants must have official transcripts submitted from all undergraduate and graduate schools.

10. Applicants must have letters of recommendation sent directly to the Admissions Office from professors under whom they have taken courses, or from physicians under whom they have done clerkships or externships. A minimum of three letters is required. If you are attending a U.S. medical school, a letter from the Dean of the school is also required, stating that you are currently enrolled and a student in good standing.

11. Applicants are advised that, if accepted, they will enter into the third year of our program and will be required to complete all of the last two years of our curriculum.

12. Applicants must apply directly to this College of Medicine. Applications will be available after November 1st - deadline for receipt of application and domicile affidavit is March 31st.
List of Important Addresses

University of Arizona College of Medicine
Tucson, Arizona 85724
- Admissions Office (602) 626-6214 or 6215
- Student Affairs (602) 626-6216

Association of American Medical Colleges (AAMC)
Suite 200
One Dupont Circle, N.W.
Washington, D.C. 20036
(202) 828-0570

American Medical College Application Service (AMCAS)
Association of American Medical Colleges
Division of Student Services
Suite 301
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036-1989
(202) 828-0600

National Board of Medical Examiners (NBME)
3930 Chestnut Street
Philadelphia, Pennsylvania 19104
(215) 349-6400

Medical College Admission Test (MCAT)
c/o American College Testing Program
Box 414
Iowa City, Iowa 52243
(319) 337-1276

Educational Commission for Foreign Medical Graduates (ECFMG)
3624 Market Street
Philadelphia, Pennsylvania 19104
(215) 386-5900

Medical Sciences Knowledge Profile (MSKP)
Association of American Medical Colleges
Suite 301
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036-1989
(202) 828-0600
STUDENT AFFAIRS

Orientation

Orientation occurs on the three days prior to the start of classes. Its purpose is to acquaint the student with classmates, curriculum information, computer instruction, upper-classmen, members of the administration, faculty and staff. Activities will include registration and the procedural matters related to enrollment. Information and schedules of activities are sent to entering students during the preceding spring and summer.

Housing

Medical students must assume the responsibility for making their own living arrangements. However, assistance in finding accommodations in University housing is available from the Director of Residence Life. Rooms in the University residence halls are available through the Department of Residence Life for unmarried students on a space available basis, according to date of application.

Married students may apply for a unit at the University of Arizona's Family Housing Project. The project consists of 420 one-story apartments, either furnished or unfurnished, located in northeast Tucson about a 15 minute drive from the Health Sciences Center. Students may have their names placed on the waiting list immediately after being accepted by the College of Medicine. Further information concerning married student rental units may be obtained by contacting the Family Housing Office, University of Arizona, 3401 North Columbus Boulevard, Tucson, Arizona, 85712.

For additional information relevant to housing, consult the two daily Tucson newspapers and the daily student newspaper. The Associated Students' Office in the Student Union Memorial also maintains a list of available housing.
Student Health Service

All students matriculated in the College of Medicine are eligible for care at the University of Arizona Student Health Service. If an illness requires other than routine care, or the services of an outside physician or consultant (major injury, complicated medical illness, major fractures or extraordinary services), the cost of such services must be borne by the student. For this reason, some form of health insurance is strongly advised. Such supplemental insurance may be purchased at the time of registration. For a more complete description of the services available at the Student Health Center, the student is advised to consult the General Catalog of the University.

Students enrolled in the College of Medicine are required to submit proof of a tuberculosis skin test within six months of admission. Thereafter, repeat chest x-rays and skin tests will be done when deemed appropriate. Students must also submit proof of having had measles (rubeola) or been vaccinated against it. Hospital policy mandates immunity to rubella and students will be screened for serologically documented antibody titers. Those with no titer will receive live rubella virus vaccine irrespective of age. Certain types of vaccinations, such as Hepatitis B, will be available to students at cost. In all instances, these tests and vaccinations will be provided by the Student Health Service and their cost will be borne by each student involved.

The Code of Scholastic Conduct

Students who enter the College of Medicine find themselves in the company of scholars, each of whom is working to expand his/her own knowledge, to extend the boundaries of human knowledge, and to apply knowledge in the service to their fellowman. The faculty and students of the College of Medicine require that a man/woman shall act honorably in all the relations and phases of student life, and therefore, all work is conducted under an honor system. The essence of the system is that a student's word can be accepted without question as to truth and any violation of a student's word is an offense against the entire student body. The fundamental demand that the honor system makes on the individual is that each one resist less than honorable means to attain a desired end. The honor system is not an end in itself but is a framework for behavior and a means of inculcating a spirit of integrity which should sustain the student throughout his/her lifetime.

All scholastic behavior in the College of Medicine is regulated by a Code of Scholastic Conduct. Each accepted student, before matriculating, is required to read and sign a statement that he/she will abide by the Code. The Code of Scholastic Conduct shall be read to all entering students at Orientation.

Counseling and Advising

The Office of Student Affairs coordinates the advising and counseling functions for medical students. A systematic faculty advisory system is in place, and is augmented by a committee advisory system. The advisory systems are designed to help students with academic decisions, provide guidance about professional behavior and career choices, and in general, help the student in the process of becoming a physician. In addition, short term counseling is offered by the Campus Student Mental Health Unit and on a voluntary basis by faculty members of the Department of Psychiatry. Students who require or request more extensive counselling can obtain advice as to available sources from the Office of Student Affairs.

Advisory Council

In order to assist students in developing their fourth year curriculum and obtaining advice regarding residency programs, an Advisory Council has been established made up of faculty representatives from each of the residency training programs as well as two basic scientists. This committee is responsible for reviewing the student's individual schedules and
overseeing the advising of students who are interested in each of the residency programs. The committee is also the focal point for updated information regarding various residency programs and the NRMP.

Student Representatives

Students may actively participate in the affairs of the College of Medicine in a number of important and constructive ways. On a formal level, each class elects two representatives who are members of the College of Medicine Student Council. All other elected student representatives to other committees are also members of this body. The Class Representatives meet regularly with the Dean's staff to discuss issues of mutual concern. In addition, the Medical Student Council supervises the selection of student representatives to various faculty-student committees. Examples of these are the Curriculum Committee, Student Progress Committee, Committee of Nine, Honors and Awards Committee, and various subcommittees of these. A number of departments actively seek student representation for various departmental decision-making and advisory groups.

The formal election of representatives in no way prevents a student from discussing with any member of the faculty or administration issues of concern to that student. All students are encouraged to participate in the affairs of the college to the extent of their time, interest and inclination.
FINANCIAL INFORMATION

Expenses

In considering the cost of attending medical school, the student must take into account not only educational expenditures but also subsistence and personal obligations such as dependents. The basic academic budget for a student living off-campus is approximately:

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<th></th>
<th>Year I (10 mos.)</th>
<th>Year II (12 mos.)</th>
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<td>Resident</td>
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<tr>
<td>Books/Supplies</td>
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<tr>
<td>(Microscopes provided)</td>
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<tr>
<td>Room/Board</td>
<td>3,795</td>
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<td>Travel</td>
<td>1,167</td>
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<tr>
<td>Miscellaneous</td>
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<tr>
<td>(includes $90 for Boards)</td>
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<tr>
<td>Hepatitis Vaccine</td>
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<tr>
<td>TOTAL*</td>
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<td>$14,638</td>
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*Budgets subject to final approval by the Financial Aid Office; Year III and Year IV budgets are available through the Medical Financial Aid Office.

Clearance of Accounts - All candidates for the M.D., or M.D./Ph.D. degree are required to clear any indebtedness to the University before a certificate of completion of degree requirements or diploma will be released.

Financial Assistance

The College of Medicine is fortunate in that many individuals and organizations have contributed scholarship and loan funds specifically designated for medical students. Among the many persons and organizations to whom we owe our sincere thanks are:

SCHOLARSHIPS

All Care Medical Group Scholarship
Robert F. Allen Memorial Award in Cancer
Elizabeth Allison Memorial Scholarship Fund
American Indian Scholarships, Inc.
John A. Noon and Helen Noon Anderson Memorial Scholarship
ARCS Foundation, Inc.
Arizona Medical Association Scholarship Program
Dr. Henry G. Atha and Grace L. M. Atha Memorial Scholarship
Robert Bergquist Memorial Fund
Berkley Scholarship
Nelson C. Bledsoe Scholarship
Earl Bluestein Scholarship Fund
Dan Bright Scholarship Fund
Louis Cobb Memorial Scholarship
Coconino County Medical Society Scholarship
John S. Collins Scholarship
Joseph Collins Memorial Scholarship
Herman E. Demund Memorial Scholarship
Duncan Dietrich Medical Scholarship
E. Blois du Bois Foundation, Inc.
Eddie and Madelyn Earl Memorial Scholarship
Leon and Helen Feinberg Scholarship
Mary Margaret Fisher Scholarship Trust Fund
Greater Tucson Area Foundation Scholarship
Charles W. Hall Memorial Scholarship
Howard Melville Hanna Memorial Scholarship
Dr. Cruz M. Hernandez Scholarship Fund
Josephine Hess Memorial Scholarship
Benjamin S. and Estella C. Hill Foundation
Louis J. and Lois B. Kettel Endowment Scholarship Fund
Victor H. Lytle Book Scholarship
Josephine Madara Memorial Scholarship
Dr. Ruth Mahnken Memorial Fund
Marshall Foundation for Arizona Women
Salvador Mazza Scholarship
Fred C. McCormick Scholarship
Hilton J. McKeown Scholarship Fund
Medical Alumni Fund
Metzger Scholarship Fund
John A. Mulcahy Scholarship
National Medical Fellowships, Inc.
Leilani K. Parker Memorial Scholarship
Arthur J. Present Scholarship
Dr. George D. Reay Memorial Scholarship
Duncan Reid Memorial Scholarship
Alix K. Remillard Scholarship
Francis A. Roy and Dorothy Roy Memorial Scholarship in Medicine
Schudder-Smith Scholarship in Medicine
M.A. and Greta Schuele Scholarship
Delbert L. Secrist, Sr., Memorial Scholarship
Sensory Research Foundation Scholarship
Milton L. Shifman Scholarship
Blake Shumway Memorial Fund
Bernice P. Simon Memorial Scholarship
Mary Woodman Smith Memorial Scholarship in Medicine
George F. Spaulding Scholarship
Special Assistance Fund-College of Medicine
Clara and Oliver Springer Scholarship Fund
Florence Thompson Scholarship Fund
Kathleen Thompson Book Fund
William B. "Bill" and Dr. H. H. Varner Scholarship
Hans and Julia Voight Memorial Scholarship
Dr. Samuel Humes Watson Medical Scholarship
Clara Seippel Webster Memorial Scholarship
Alma L. Wilson Memorial Scholarship
Dr. Boris Zemsky Memorial Fund-Psychiatry

A number of other scholarships have been donated anonymously.
LOANS

American Medical Association Loan Fund
Arizona Medical Association Auxiliary Loan Fund
State of Arizona Medical Student Loans
Josephine F. Bennett Foundation Loan Fund
College of Medicine Emergency Loan Fund
Dougherty Foundation, Inc.
Dr. Paul S. Gaddis Memorial Loan Fund
Health Professions Student Loan Fund
Elizabeth Banes Mann Loan Fund
Marshall Revolving Loan Fund
Charles W. Sechrist Emergency Loan Fund
University Medical Center Auxiliary Emergency Loan Fund
Roy Whitehead Memorial Fund

AWARDS

Alpha Omega Alpha Inductees for Academic Excellence
American Medical Women's Association Awards
The Arizona Medical Association Prize
The Arizona Medical Association Travel Awards
Brayton Memorial Family Practice Award
Edith Petrie Brown Community Service Award
Marshall Brucer Award in Radiation Medicine
Ciba Award for Community Service
Jeff Fulginiti Memorial Award in Adolescent Medicine
Grobe Award in Family Practice
Hewlett-Packard TopOrad Academic Award
Honors and Awards Committee Excellence in Research Award
Ishiyaku/Piccin Academic Excellence Book Award
Eleanor Johnson Academic Excellence Award
Robert Wood Johnson Health Policy Fellowships
The Roy Killingsworth Award for Psychiatry
The Alvin T. Kirmse Memorial Prize in Obstetrics
The Lange Book Award for Academic Excellence
Jack M. Layton, M.D. Award for Excellence
The Merck Manual Award for Academic Excellence
Milan and Dorothy Novak Pulmonary Awards
The Bernard Revsin Memorial Scholarship
Sandoz Award for Academic Excellence
University of Arizona Foundation Outstanding Senior Award
Upjohn Award for Outstanding Academic Achievement

Allocations of financial assistance are made solely on the basis of need and according to the availability of funds with the exception of several awards which are given for academic achievement. Only those students whose personal savings, earnings, and aid from family sources are inadequate to meet their needs can be considered for financial assistance. Such determinations are made only after an applicant has been accepted to the College of Medicine.

Generally, the resources of the College of Medicine are insufficient to meet the total needs of the students. Outside sources must then be employed. Additional loans are available to Arizona medical students through Guaranteed Student Loans, Health Education Assistance Loans, and Supplemental Loans for Students. The American Medical Student Association and the National Association of Residents and Interns offers loans to senior medical students. The Army, Navy and Air Force, as well as the Arizona Student Loan Board, offer financial assistance in return for service commitments. Applications may be obtained from the Student Financial Aid Office of the College of Medicine.

For emergency situations, special short-term loans can be obtained from the Student Financial Aid Office.
STUDENT PROGRESS

General

Student progress, in its broadest sense, includes not only the system used to evaluate academic performance, but also the guidelines for academic and nonacademic performance, the procedures used to monitor student progress, as well as the structure of the student counseling and advising systems. The faculty and administration of the College of Medicine continually review all aspects of student progress. From these reviews over the years, several basic features have become apparent. First, the grading and evaluation system must be fair and informative to both faculty and students and should minimize competition between students while encouraging the acquisition of skills and knowledge. Second, it is essential to identify, as early as possible, those students with potential academic or nonacademic problems and to provide appropriate constructive remedies. Third, mechanisms must be available to insure that only qualified candidates receive the M.D. degree. Finally, it is necessary to provide a fair and impartial method of appeal for those students against whom there is adverse action for academic or nonacademic reasons. Within this broad framework, information pertaining to each area is set forth below. This information represents a compilation from several source documents, which are on file and may be reviewed in the Dean's Office.

Evaluation System

The College of Medicine utilizes an Honors-Pass-Fail grading system augmented by narrative evaluations of student performance in each medical school course or clerkship. Specific grades that may be awarded include:

S = Honors; High performance based on individual course standards
P = Pass; Satisfactory completion of course
F = Fail; Unsatisfactory completion of course
I = Incomplete; Awarded at the end of a course when a small portion of a student's work is incomplete and when the student would be required to complete only that portion to earn a passing grade. This grade reverts to a Fail if not completed within one year.
W = Approved withdrawal
K = Course in progress

Prior to a specified time, which is approximately one-third of the way through each course, or ten days after the mid-term examination, a student will receive the grade of W, upon withdrawing from a course. After this time, however, the grade of W may be awarded only if the work is at a passing level; otherwise, the grade of F is recorded.

Any student whose performance is marginal or failing at any point during a course will be so notified in writing. The notification is intended to alert the student of potential problems and to encourage the use of tutorial or other appropriate assistance.

Written, narrative evaluations for each student are submitted to the Student Records Office at the conclusion of each course, along with the specific grade. These narrative evaluations detail individual strengths and weaknesses of performance and are intended to provide feedback to the student, data for the Student Progress Committee and information for the Dean's letters of recommendation. All students may request to see their own evaluations by contacting the personnel in the Student Records Office. Any student with questions about an evaluation may contact the course coordinator directly or consult with the Associate Dean for Student Affairs.
Under this system, no attempt is made to determine specific class standing. However, the College of Medicine Honors and Awards Committee reviews all written evaluations in order to identify outstanding student performance. Students so selected may receive an award at graduation and/or may be elected to Alpha Omega Alpha, the medical honor society.

Student Progress Guidelines

The Student Progress Committee is given the responsibility to monitor and evaluate student performance and to make decisions appropriate to each individual case. This committee consists of eight elected faculty members and one student from each class. The Committee is charged with reviewing the record of each student at least once each year. The purpose of such a review is: First, to identify performance problems sufficiently early to recommend appropriate action for the prevention of future problems and; second, to recommend actions for those who fail a course (or courses).

The academic guidelines utilized by the Student Progress Committee include the following:

1. To be academically qualified for graduation, a student must pass all required courses and the requisite number of elective courses, as well as pass Part I and Part II of the National Board of Medical Examiners examination.
2. Continued enrollment in the College shall be contingent on satisfactory academic performance as defined below.
3. The Student Progress Committee shall order dismissal in any case where a student fails one course for a second time or where a student fails three (or more) courses in medical school. A failure will be counted as such even if the student has subsequently passed the course.
4. In cases where a student fails a course not requiring an order of dismissal, the Student Progress Committee may recommend whatever action is deemed appropriate to the particular situation, including dismissal, although the latter would occur only under exceptional circumstances.
5. Transfer students. In the case of students who transfer to the College of Medicine for the clinical sciences portion of the curriculum, the Student Progress Committee shall order dismissal in any case when a student fails one course for the second time or when a student fails two (or more) courses in medical school. (For purposes of this paragraph, a failure will be counted as such even if the student has subsequently passed the course.) Failures incurred prior to transfer will not be considered. Other academic guidelines apply, unaltered, to transfer students.

There are certain time constraints on student progress, although these are intended to be sufficiently flexible to accommodate those students who choose to take advantage of educational experiences beyond the confines of the curriculum. These time constraints are as follows:

1. An entering student will normally take two years to complete the work in the basic sciences. Extended courses of study will be reviewed by the Student Progress Committee.
2. Students will normally be expected to register for a full course load. A student may schedule up to 12 weeks of free time during the clinical sciences.
3. Students desiring more or longer periods away from school may petition the Student Progress Committee for a formal leave of absence. Such leaves shall normally not exceed one year.
4. Students may take electives, for which they meet the prerequisites, prior to completion of the basic science years. However, these electives may be used to fulfill clinical science or elective requirements for graduation only with prior permission of the Curriculum Committee.
In addition to academic factors, satisfactory student progress also includes other factors. Those which may be considered as disqualifying for the M.D. degree include:

1. Chronic, disabling physical or emotional illness
2. Unethical conduct
3. Dishonest scholastic work (see The Code of Scholastic Conduct, page 26).

Other factors may be considered if, in the opinion of the Student Progress Committee, they would make it inappropriate to award the M.D. degree.

Appeals

Any student has the right to appeal an adverse decision of the Student Progress Committee to a separate faculty body, the Student Appeals Committee. This group consists of one appointed representative from each academic department in the College. The student may present to this Committee any information deemed pertinent to the case. The Student Appeals Committee will review charges, hear evidence, and consider mitigating circumstances before rendering a decision. Such decisions may affirm, modify or reverse the original action of the Student Progress Committee, although the penalty, if any, may not be increased. Such decisions are binding within the College and may not be appealed further at that level.
KEY TO COURSE LISTINGS

Most medical students will find that registration in medical school is a relatively simple process. The basic curriculum for medical students is outlined on pages 12-14. However, for the information of the faculty and others concerned with scheduling and course numbering, this section explains the course numbering system used in the College of Medicine.

This catalog contains listings of courses offered by College of Medicine departments for advanced undergraduates and graduate students as well as courses offered for medical students.

The number by which a course is designated indicates the level of the course.

Courses numbered:
400-499 inclusive: Advanced-level courses. Acceptable for graduate credit with the prior approval of the Graduate College (except 400-level individual studies courses 491, 493, 494, or 499, with or without subscripts).
500-599 inclusive: Graduate courses. Open to exceptionally well-qualified seniors with the prior written approval of the course instructor and the Graduate College.
600-699 inclusive: Graduate courses. Not open to undergraduate students.
700-799 inclusive: Graduate courses limited to doctoral students.
800-899 inclusive: Courses limited to students working toward degrees offered by the College of Medicine or the College of Pharmacy. Not available for credit toward any other degrees.

The following is a list of definitions of the University-wide “house-numbered” courses available to the College of Medicine departments as well as other departments throughout the University.

Colloquium (courses numbered 495, 595, 695, 795, 895): The exchange of scholarly information and/or secondary research, usually in a small group setting. The exchange of ideas may involve written as well as oral communication. Research projects need not be required of course registrants.

Proseminar (496) and Seminar (courses numbered 596, 696, 796, 896): The development and exchange of scholarly information, usually in a small group setting. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.

Note: The above listing does not include all “house-numbered” courses, as other “house-numbered” courses are generally not used by the College of Medicine. For further information regarding these listings, please refer to the current University of Arizona General Catalog.

The definitions listed below are general categories of courses offered within the College of Medicine.

Clinical Clerkship (803): Closely supervised clinical activities designed to teach basic clinical skills within a discipline to Year III medical students.
Specialty Clerkship (807): In addition to general surgery each student is required to have exposure to a Surgery Specialty Clerkship (as assigned by the Surgery Department). (Please note: this course applies to the Department of Surgery only.)
Clerkship (810): Elective courses designed to develop and refine the clinical skills of medical students. Often allow the opportunity to apply basic skills in a new location or to a special population while continuing to focus on the broad objectives of a discipline.
Subinternship (811): Elective allowing medical students to experience general subinternship roles of patient care in clinics and hospital wards under the direct supervision of a faculty member.

Subspecialty (815): Electives allowing advanced medical students the opportunity to explore subspecialty areas within a department.

Supplementary Registration (830): For students who are extending their curriculum in order to spend a year, or less, doing research relevant to their medical education.

Preceptorship (891): Specialized advanced work on an individual basis, consisting of instruction and practice in actual service in a department, program or discipline.

Independent Study (599, 799, 899): Qualified students work on an individual basis with professors who have agreed to supervise such work.

Research (800/900): Individual research by medical (800) or graduate (900) students, not related to a thesis or dissertation.

Thesis (910): Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing).

Dissertation (920): Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing.)

Supplementary Registration (930): For students who have completed all course requirements for their advanced degree programs. May be used concurrently with other enrollments to bring the total number of units to the required minimum.
Key to Symbols

The standard course description includes a variety of symbols indicative of essential information. The following is a standard course description with the individual symbols explained in the order in which they appear in that description.


401..................Number of course.
Ethics of Medicine......Title of course.
(3)....................Number of units of course.
[Rpt.]..................May be repeated for credit. A restriction regarding the number of times a course may be repeated for credit or the total number of units of credit permitted for a course may be designated. [Rpt./2] indicates that the course may be repeated for credit a maximum of two times; [Rpt./6 units] means that the course may be repeated until the student has received a total of six units of credit.
GC....................Graduate credit available. Applies to 400 level courses only.
I, II.....................Semester offered. I indicates Fall semester; II, Spring semester.
1987-1988................Year in which course is offered. If no year designation is given, the course is offered each year.
Yr......................Course offered throughout the year for various lengths of time other than semester(s).
Jones...................Professor in charge of course. If "Staff" is listed, then the departmental staff is in charge of the course.
A review of current topics pertaining to the ethics of medicine......Description of course.
P.........................Prerequisite(s).
CR.......................Concurrent Registration.
(Identical with Family and Community Medicine 401) Other departments which give credit in their department for the same course. If no course description appears, please consult the cross listed department.

Note: Not all of the above information may be noted in any individual course.

Elective Courses at the College of Medicine are listed and described in the Electives Manual, an in-house publication of elective offerings designed primarily for Year IV medical students. The Electives Manual is available each February.
INTERDEPARTMENTAL COURSES

495. Colloquium (2-4)  
a. Introduction to the Neurosciences I (2) GC  
   An introductory overview of mammalian neural structure and function. Neuroanatomical and neurophysiological principles are emphasized. P, permission of instructor. (Identical with Anat. 495a and Psio. 495a)  
b. Introduction to the Neurosciences II (2) GC  
   An introductory overview of clinical conditions that affect the human nervous system. P, 495a or permission of the instructor. (Identical with Neur. 495b, Psio. 495b and Psy. 495b)

596. Seminar (1-3) Yr. (See Electives Manual)  
   These seminars are designed principally for medical students during the elective portion of their curriculum. Basic biological or behavioral science principles and their application in the medical setting are emphasized, with student participation in discussion and group leadership encouraged. Seminars may be combined with other part-time clinical or nonclinical electives to constitute a full-time academic load. An Electives Manual is available yearly in the Student Records Office, College of Medicine, and details specific course titles, numbers, prerequisites, and descriptions for that academic year.

801. Preparation for Clinical Medicine (PCM) (1-12) II  
   Preparation for Clinical Medicine (PCM) is the clinical companion course to the basic sciences. The course begins the first week of medical school and continues until the beginning of the first clinical rotation. The overall objective is to provide students with skills, behavioral traits, attitudes and knowledge necessary to enter clinical clerkships. PCM is divided into three main course segments: 1. Patient evaluation, including physical examination, clinical interviewing, specialty examinations and write-ups. During this segment students interact with patient instructors and also spend one semester interacting with a physician preceptor; 2. Clinical correlations (clinical problem solving) with basic sciences courses; and 3. Free-standing course segments, including introduction to psychiatry and psychopathology, clinical decision making (biostatistics and logic), community-oriented primary care, emergency medicine, introduction to nuclear medicine, patient care skills workshop and radiology practicum. At the completion of PCM, students will have achieved a prescribed level of skill in data collection, definition of clinical problems and a logical approach to differential diagnosis.

802. Human Behavior and Development (HB&D) (6)  
   This course is an interdepartmental, required course which is taught as part of the basic science curriculum. In the same way that the traditional basic sciences serve as the background for understanding clinical medicine, HB&D serves as the "basic science" for understanding the psychosocial and emotional aspects of clinical medicine. The student will gain knowledge and understanding of the individual as a "total person," and of biological, environmental, social and psychological factors which influence that person as a patient. Also explored are the principal age-specific life events, environmental stresses, biological processes and social behaviors which contribute to normal human development and to individual sickness. Panel discussions, lectures, patient interviews, small group discussions, field trips, etc., are utilized in this interdisciplinary course to achieve the objectives. Some of the topics included in the course are the doctor-patient relationship, major health problems for children and adults, substance abuse, issues in human sexuality, coping with chronic illness, health care and the elderly, death and dying, ethical issues in medicine and legal aspects of medical care.

830. Supplementary Registration  
   To provide credit to medical students doing extended research for which they will gain no credit towards their M.D. degree while allowing medical students to participate in the benefits of being an enrolled student.

896. Seminar (1-3) Yr. (See Electives Manual)  
   These seminars are designed principally for medical students during the elective portion of their curriculum. Basic biological or behavioral science principles and their application in the medical setting are emphasized, with student participation in discussion and group leadership encouraged. Seminars may be combined with other part-time clinical or nonclinical electives to constitute a full-time academic load. An Electives Manual is available yearly in the Student Records Office, College of Medicine, and details specific course titles, numbers, prerequisites, and descriptions for that academic year.
DEPARTMENTAL COURSES

ANATOMY

Professors: Robert S. McCuskey, Head, Jay B. Angevine, Jr. [Lecturer, Neurology], Joseph T. Bagnara, Bryant Benson, C. Donald Christian [Professor & Head, Obstetrics & Gynecology], Mac E. Hadley [Molecular & Cellular Biology], Philip H. Krutzsch, Donald P. Speer [Surgery], Nicholas J. Strausfeld [Arizona Research Laboratories-Neurobiology]

Visiting Research Professor: Jetskina Ebels

Associate Professors: David E. Blask, Mary J. C. Hendrix, C. Ward Kischer, R. Clark Lantz, Albert V. LeBouton, Mary E. Morbeck [Anthropology]

Visiting Research Associate Professor: Eugene Cilento [Adjunct Visiting Associate Professor, Chemical Engineering]

Assistant Professors: Gail D. Burd [Molecular and Cellular Biology], Christopher A. Leadem, Paul A. St. John, Leslie P. Tolbert [Arizona Research Laboratories-Neurobiology]

Research Assistant Professors: Elizabeth G. Crichton, Chung-Su Yuan

Lecturers: William D. Barber, Norman E. Koelling [Pharmaceutical Sciences]

Senior Clinical Lecturer: James C. Dunn

Clinical Lecturer: Harry R. Claypool [Lecturer, Radiology]

Research Associates: Toshihiko Fukuzawa, Ursula E. Hauser, Patricia A. McCuskey [Internal Medicine], Ronald L. Misiorowski [Research Associate Professor, Surgery], Jana Pindur, Richard Seftor, Karin H. Yohem

Associate Research Engineer: Michael Bosnos

Assistant Research Scientist: Linda C. Meade-Tollin [Lecturer, Biochemistry]

Anatomy has central responsibility for the teaching of morphological systems. Its contributions occur at the gross, microscopic, and ultrastructural levels and have exerted strong influence on many areas of biology and medicine over the years. It is the desire and purpose of the Department of Anatomy to express a meaningful picture of the discipline and its relationship to the synthesis of chemical, physical, and biological facts in a challenging and responsible program.

The Department of Anatomy offers a program of graduate study which leads primarily to the Doctor of Philosophy degree; a degree of Master of Science is awarded only in rare instances. The requirements for these degrees are those outlined by the Graduate College. Candidates for graduate work in anatomy are expected to possess a significant knowledge of mathematics, statistics, and the physical sciences, as well as of biology, in order to meet the demands of a growing discipline. Course work possibilities span the continuum of morphological investigation from ultrastructure (electron microscopy) to gross human structure. Graduate study in anatomy primarily offers the candidate an opportunity to become proficient in research in areas such as: histochemistry, histophysiology, endocrinology, reproductive biology, neuroendocrinology, embryology, cancer cell biology, comparative neuroanatomy, neuropathology, and so on. A large number of possibilities exist regarding the minor subject in the doctoral program. A broad range of departmental facilities exist including laboratories for microscopy, analytical chemistry, cell culture, electrophysiology and radioimmunoassay. For detailed information concerning graduate programs in the Department of Anatomy, consult the catalog of the Graduate College and the departmental Graduate Advisor.
Course Descriptions

399H. Opportunities in Biomedical Research (1-3) (Honors)  Leadem
Opportunity to provide upper level undergraduate students with experience in designing, conducting, and interpreting biomedical experiments. P, Admittance to Honors Program, Chem. 103b, 104b, 243b, 245b.

401. Human Gross Anatomy (3) II  Koelling
Survey of the gross structure of the human body. 1R, 6L. Open to pharmacy students only. (Identical with PCOL 401)

406. Principles of Neuroanatomy (4) GC II  Angevine

415. Vertebrate Reproductive Biology (2) I  Hadley
Vertebrate reproductive biology. Structure, function, and control of the vertebrate reproductive system.

456. Developmental Biology (4) GC I  Bagnara
Descriptive aspects of development. P, MCB 103 (Identical with MCB 456 which is home)

457. Experiments in Developmental Biology (4) GC II  Bagnara
Experimental analysis of the principles of development. P, 456, Chem. 241b (Identical with MCB 457 which is home)

467R. Endocrinology (3) GC II  Hadley
Neural and endocrine integration in the regulation of mammalian physiological functions. P, M.C.B. 103. (Identical with M.C.B. 467R)

467L. Endocrinology (1) GCII  Hadley

495. Colloquium Introduction to the Neurosciences I (2) GC  Staff
An introductory overview of mammalian neural structure and function. Neuroanatomical and neurophysiological principles are emphasized. P, permission of instructor. (Identical with Interdept. 495a which is home)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor/Staff</th>
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<tbody>
<tr>
<td>499H</td>
<td>Independent Study, Honors Program (3)</td>
<td>Staff</td>
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<tr>
<td>550</td>
<td>Topics in Pigment Cell Biology (2) I</td>
<td>Bagnara-Hadley</td>
</tr>
<tr>
<td>555</td>
<td>Cancer Biology (3) II, Alternate Year, 1988-89</td>
<td>Bowden-Gerner</td>
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<tr>
<td>558</td>
<td>Advanced Subjects in Endocrinology (2) [Rpt.] I</td>
<td>Hadley</td>
</tr>
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<td>599</td>
<td>Independent Study (1-6) I, II</td>
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<tr>
<td>601</td>
<td>Human Gross Anatomy (8) I</td>
<td>Blask-Staff</td>
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<td>602</td>
<td>Microscopic Anatomy (5) I</td>
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<td>Microscopic Structure (1-3) II</td>
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<td>Neurosciences (6) II</td>
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<td>606</td>
<td>Advanced Vertebrate Neuroanatomy (4) I, II</td>
<td>Angevine</td>
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<tr>
<td>610a</td>
<td>Anatomical Techniques (1-4, 1-4) I, II</td>
<td>LeBouton-Staff</td>
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<tr>
<td>610b</td>
<td>Introduction of special techniques and procedures of analytical anatomy</td>
<td>LeBouton-Staff</td>
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<tr>
<td>616</td>
<td>Introduction to Anatomical Literature (1) I, II</td>
<td>Staff</td>
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<tr>
<td>696</td>
<td>Seminar (1) II</td>
<td>Staff</td>
</tr>
<tr>
<td></td>
<td>b. Biological, Structural and Functional Interactions. [Rpt./4]. Open to majors only.</td>
<td>Staff</td>
</tr>
<tr>
<td>801</td>
<td>Human Gross Anatomy (8) I</td>
<td>Blask-Staff</td>
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<tr>
<td>802</td>
<td>Microscopic Anatomy (5) I</td>
<td>Hendrix-LeBouton-Staff</td>
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<tr>
<td>805</td>
<td>Neurosciences (6) II</td>
<td>Barber-Angevine-Stuart</td>
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<tr>
<td>891</td>
<td>Preceptorship, Yr.</td>
<td>Staff</td>
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<tr>
<td>899</td>
<td>Independent Study (1-6) I, II</td>
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<td>900</td>
<td>Research (1-8) I, II</td>
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<td>Dissertation (1-9) I, II</td>
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<td>930</td>
<td>Supplementary Registration (1-6) I, II</td>
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</tbody>
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ANESTHESIOLOGY

Professors: Burnell R. Brown, Jr., Head [Pharmacology], I. Glenn Sipes [Pharmacology; Head, Pharmacology & Toxicology]
Associate Professors: Randall C. Cork, A. Jay Gandolfi [Pharmacology; Research Assistant Professor, Pharmacology & Toxicology], Stuart R. Hameroff, Charles W. Otto [Assistant Professor, Internal Medicine], Stuart F. Quan [Associate Professor, Internal Medicine; Assistant Director, Respiratory Sciences; Research Associate, Respiratory Sciences]
Adjunct Associate Professor: Kenneth C. Mylrea [Associate Professor, Electrical & Computer Engineering; Director, Clinical Engineering]
Assistant Professors: Joseph A. Gallo, Jr. [Associate Head, Anesthesiology], Lawrence B. Weiss, Paul J. Scipione
Clinical Assistant Professor: Daniel P. Ferry
Research Associates: Shana Azri, Hanan Ghantous, Andrea H. Hubbard [Research Assistant Professor, Microbiology & Immunology, Pharmacology & Toxicology], Sandra M. Sylvester
Clinical Lecturer: Casey D. Blitt
Assistant Clinical Lecturer: Fred H. Landeen
Research Specialist: Richard C. Watt [Electrical and Computer Engineering]
Associates: James P. Angiulo, R. Dennis Bastron, Fred H. Landeen, Peter A. Raudzens, Conrad L. Wall, Thomas A. Webster, Elizabeth L. Wilkinson, Alan E. Zehngut

The Department of Anesthesiology provides the clinical clerks with theoretic and practical instruction in the following areas: 1) management of surgical and obstetric anesthesia; 2) acute clinical pharmacology and physiology; 3) resuscitation and management of the comatose patient; 4) treatment of intractable pain; 5) management of the patient in the intensive care unit. The concepts taught are germane to acute therapy and catastrophic illness that may be encountered by the future physician regardless of field of practice.

Course Descriptions

800. Research (1-6) [Rpt./1] Yr. Staff
     See Electives Manual for course description.

810. Clerkship, Yr.1 Brown-Staff
     a. Anesthesiology (4)
        Students participate in anesthesiology at University Medical Center and Veterans Administration Medical Center.

815. Subspecialty, Yr. Otto-Staff
     p. Critical Care Medicine (6) Yr.

891. Preceptorship, Yr. Staff
     a. Anesthesiology and Subspecialties (3-18)
     c. General Anesthesiology Preceptorships (4-6)
        See Electives Manual for course descriptions.
UNIVERSITY DEPARTMENT OF BIOCHEMISTRY  
(Colleges of Agriculture and Medicine and the Faculty of Science)

Professors: Michael A. Wells, Head, Herbert E. Carter, Michael A. Cusanovich [Chemistry], Leslie S. Forster [Chemistry], Eugene W. Gerner [Radiation Oncology], Darrell E. Goll [Nutrition & Food Science], Richard B. Hallick [Molecular & Cellular Biology], David J. Hartshorne [Nutrition & Food Science], Mark R. Haussler, John Hildebrand [Molecular & Cellular Biology; Head, Neurobiology], Victor J. Hruby [Chemistry], Richard G. Jensen [Plant Science], Henry Koffler [Microbiology & Immunology; Molecular & Cellular Biology; President, University of Arizona], John H. Law [Director, Biotechnology], David W. Mount [Molecular & Cellular Biology], John A. Rupley [Chemistry], Gordon Tollin [Chemistry], Henry I. Yamamura [Pharmacology, Arizona Laboratories; Associate Professor, Psychiatry]
Research Professor: Robert G. Bartsch
Visiting Professor: Frank Herzfeld
Associate Professors: Hans J. Bohnert [Molecular & Cellular Biology], Don P. Bourque [Agriculture, Molecular & Cellular Biology], Louise M. Canfield, Wah Chiu [Molecular & Cellular Biology], William J. Grimes [Molecular & Cellular Biology], Murray Korc [Internal Medicine], John W. Little [Assistant Professor, Molecular & Cellular Biology], Marc E. Tischler [Physiology]
Research Associate Professor: Terrance E. Meyer
Research Assistant Professors: Jo Holt Hazzard, Tzyy-Wen Jeng, Robert Eric Johnson, Barry S. Komm, Michael C. Little, David Morgan, Robert O. Ryan, Rolf Ziegler
Senior Lecturer: Linda C. Meade-Tollin [Assistant Research Scientist, Anatomy]

Research in biochemistry is carried out principally in Bioscience West and Arizona Health Sciences Center, while teaching is carried out at various campus locations. The above-listed faculty members constitute the University Department of Biochemistry which is responsible for instruction in biochemistry in the Colleges of Agriculture, Liberal Arts, and Medicine.

The University Department of Biochemistry offers the Bachelor of Science, Bachelor of Arts, Master of Science and Doctor of Philosophy degrees. Except in unusual circumstances, however, the department will only admit graduate students whose stated objective is the Doctor of Philosophy degree.

Research areas in which graduate studies may be pursued include nucleic acid biochemistry, regulation of gene expression, enzymology, lipid metabolism and chemistry, membrane structure and function, amino acid metabolism, complex polysaccharides, mammalian cell culture, mechanism of hormone action, biochemistry of vitamins and coenzymes, protein structure and function, bioenergetics, muscle metabolism, biological oxidations, photosynthesis, rapid reaction kinetics, visual processes, plant biochemistry, biochemistry and genetics of cell organelles, insect biochemistry.

For detailed information, consult the catalog of the Graduate College.
Course Descriptions

460. General Biochemistry (5) GC I  
Fundamentals of biochemistry, including proteins, nucleic acids, enzymes, carbohydrates and lipids and their metabolic relationships. Open to non-majors only. P, Chem. 241b. (Identical with Chem. 460 and N.F.S. 460)

462a-462b. Biochemistry (4-3) GC  
Introduction to the properties and metabolism of proteins, nucleic acids, enzymes, carbohydrates and lipids. Designed primarily for majors and minors in chem, bioc, and biol. P, Chem. 241b, 325. Bioc. 462a is a prerequisite to 462b. (Identical with Chem. 462a-462b and Tox. 462a-462b)

463. Biochemistry Laboratory (2) GC II  
Introduction to experimentation with biochemical systems, processes, and compounds of biochemical importance. 1R, 5L. P, Bioc. 460 or CR 462a-462b.

494. Practicum (3) I, II  
Senior research experience in the labs of individual faculty members. P, CR 462a-462b.

496. Proseminar (1) [Rpt./1] I, II  
Open to majors only. Consult department before enrolling. P, 462a-462b or CR.

501. Medical Biochemistry (5) I  
Comprehensive treatment of general biochemistry, oriented towards human biology, with emphasis on basic concepts. Protein and nucleic acid chemistry and metabolism, enzymology, metabolism of lipids and carbohydrates, metabolic regulation and closely related topics are covered. Open only to medical students except by permission. P, Chem. 103b, 104b, 241b, 245b; Phys. 102b.

504. Intermediate Medical Biochemistry (5) I  
An intermediate treatment of several areas of general biochemistry including metabolism and nutrition, genetics and membranes. Designed to build on the student's prior knowledge of biochemistry. Bioc. 804 open to medical students only; others consult department before enrolling. P, 462a-462b.

555. Molecular Mechanisms of Development (3) II  
Detailed examination of molecular, genetic and cellular approaches to selected problems in developmental biology. P, consult department before enrolling. (Identical with M.C.B. 555 which is home)

561a. Introduction to Biochemical Literature (1-1)  
A discussion of the biochemical literature aimed at helping the student evaluate and report the published literature. Primarily for first-year graduate students planning a career in biochemistry and desiring to prepare themselves for continued study. P, CR 462a-462b. 561a is not prerequisite to 561b. (Identical with Chem. 561a-561b)

565. Enzymes (3) (II) 1988-89  
Advanced consideration of enzyme structure and function. Course to be taught alternate years beginning 2nd semester 1986-87 academic year. P, 462a, Chem. 480b. (Identical with Chem. 565)

568. Nucleic Acids (3) (II)  
Chemistry, structure, and function of nucleic acids; replication, transcription, translation, gene organization, regulation of gene expression and organelle nucleic acids. Both procaryotic and eucaryotic systems will be considered. P, 462b (Identical with M.C.B. 568a-568b, and N.F.S. 568a-568b)

570. Molecular Biology of the Cell Membrane (3) II 1988-89  
Cell membrane functions including biosynthesis, structures of membrane components; importance of cell communication, differentiation, adhesion, immune response, and cancer. Discussions on the use of monoclonal antibodies, recombinant DNA technology, and DNA transfections in studies on the biology of the cell membrane. (Identical with Chem. 570 and Cell. 570)

572. Metabolic and Hormonal Control of Cell Function (3) II 1988-89  
Advanced treatment of the biochemical aspects of metabolic regulation and hormone action. P, 462a-462b. (Identical with Chem. 572)

575. Biochemical Techniques (3) I  
Survey of current techniques used in biochemical research including methods used to study proteins, nucleic acids, membranes, and metabolism. P, 462a-462b. (Identical with Chem. 575)

576. Biophysical Techniques (3) I  
Survey of current physical techniques used in biochemical research including solution properties of macromolecules, optical spectroscopy, magnetic resonance and x-ray and electron diffraction. P, 462a-462b and Chem. 480a-480b. (Identical with Chem. 576)
595. **Colloquium**
   b. Topics in Electron Microscopy (2) [Rpt./2] 1987-88 II (Identical with M.C.B. 595b which is home)

599. **Independent Study (1-5) I, II**
   Staff
   Open to students who wish to pursue topics not covered in regularly scheduled courses. Arrangements must be made with the appropriate staff member and the biochemistry program chairman before registration.

665. **Chemistry of Food Proteins (3) II 1987-88**
   Goll
   The chemical and physical properties of proteins important to their use as food; analysis and purification of proteins; biochemical properties of proteins in muscle, milk, eggs, cereals, and other foods. P, Bioc. 462a preferred, Bioc. 460 or N.F.S. 406a-406b acceptable. (Identical with N.F.S. 665 which is home)

681. **Introduction to Biochemical Research (1-2) I, II**
   Staff
   Supervised research experiences in the laboratories of individual faculty members. Required for all first-year graduate students in biochemistry and open only to these students. 3 or 6 L. P, CR 561a-561b.

696. **Seminar (1-3) I, II**
   Staff
   Student reports on current research topics. Participation required for all graduate students in biochemistry but registration not required in all semesters.
   a. Biochemistry I (1-3) I
   b. Biochemistry II (1-3) II
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>799</td>
<td>Independent Study (1-5) I, II</td>
<td>Staff</td>
<td>Open to graduate students seeking a Ph.D. in Biochemistry.</td>
</tr>
<tr>
<td>800</td>
<td>Research (1-6) Yr.</td>
<td>Staff</td>
<td>See Electives Manual for course description.</td>
</tr>
<tr>
<td>801</td>
<td>Medical Biochemistry (5) I</td>
<td>Staff</td>
<td>Comprehensive treatment of general biochemistry, oriented towards human biology, with emphasis on basic concepts. Protein and nucleic acid chemistry and metabolism, enzymology, metabolism of lipids and carbohydrates, metabolic regulation and closely related topics are covered. Open only to medical students except by permission. P, Chem. 103b, 104b, 241b, 245b; Phys. 102b.</td>
</tr>
<tr>
<td>804</td>
<td>Intermediate Medical Biochemistry (5) I</td>
<td>Haussler</td>
<td>An intermediate treatment of several areas of general biochemistry including metabolism and nutrition, genetics and membranes. Designed to build on the student's prior knowledge of biochemistry. Bioc. 804 open to medical students only; others consult department before enrolling. P, 462a-462b.</td>
</tr>
<tr>
<td>891</td>
<td>Preceptorship, Yr.</td>
<td>Staff</td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>Research (1-5) I, II</td>
<td>Staff</td>
<td>Individual research by graduate students, not related to a thesis or dissertation; the student will write for an advanced degree.</td>
</tr>
<tr>
<td>910</td>
<td>Thesis (1-5, max. total 8) I, II</td>
<td>Staff</td>
<td>Research for the master's thesis.</td>
</tr>
<tr>
<td>920</td>
<td>Dissertation (1-9) I, II</td>
<td>Staff</td>
<td>Research for the doctoral dissertation.</td>
</tr>
<tr>
<td>930</td>
<td>Supplementary Registration (1-6) I, II</td>
<td>Staff</td>
<td></td>
</tr>
</tbody>
</table>
FAMILY AND COMMUNITY MEDICINE

Professors: Anthony F. Vuturo, Head, Herbert K. Abrams, John T. Boyer [Internal Medicine; Director, Restorative Medicine], George D. Comerci [Pediatrics], Eric P. Gall [Internal Medicine, Surgery], Gail G. Harrison [Associate Professor, Pediatrics, Nutrition & Food Science, Anthropology], Thomas E. Moon, [Research Professor, Internal Medicine], Andrew W. Nichols, James R. Shaw, Paul H. Skinner [Director, Native American Research & Training Center], William A. Stini [Anthropology], Hugh C. Thompson [Emeritus, Pediatrics]

Clinical Professors: Pedro Luis Escobar [Internal Medicine; Director, Rehabilitation Services; Chief, Physical Medicine & Rehabilitation, Restorative Medicine], Augusto Ortiz

Research Professors: Frank L. Meyskens, Jr. [Professor, Internal Medicine, Communications; Associate Professor, Molecular & Cellular Biology], Ronald R. Watson [Research Specialist, Cancer Center]

Adjunct Professors: Elliott M. Heiman [Psychiatry], Paul B. Pearson [Nutrition & Food Science]

Visiting Professor: Osman M. Galal

Associate Professors: Peter J. Attarian, Associate Head [Assistant Professor, Psychiatry], Daniel O. Levinson, Ronald E. Pust [Clinical Director, St. Elizabeth of Hungary], Cheryl K. Ritenbaugh [Adjunct Associate Professor, Anthropology; Research Associate, Cancer Center], Arthur B. Sanders [Surgery; Clinical Lecturer, Internal Medicine]

Clinical Associate Professor: Lawrence M. Moher

Research Associate Professor: Frank A. Hale

Adjunct Associate Professors: Katherine J. Graham [Associate Professor & Coordinator, Community Health Nursing, College of Nursing], John H. Hughes [Associate, Surgery]

Assistant Professors: Douglas E. Campos-Outcalt, Larry C. Clark, Dorian H. Cordes [Director, Occupational & Preventive Medicine Residency Programs], Jennie R. Joe [Co-Director, Native American Research & Training Center], Evan W. Kligman, Richard L. Reed, Barry D. Weiss [Clinical Director, Family Practice Office]

Clinical Assistant Professors: Kay A. Bauman, Murray M. DeArmond [Psychiatry; Lecturer, Psychology; Director, Student Health Service], Ann K. Henry, Craig L. McClure, Robert G. Rhode [Clinical Lecturer, Psychiatry; Visiting Assistant Professor, Psychology], Bernhardt E. Stein, Marjorie L. Tiedemann, Barbara H. Warren [Internal Medicine]

Research Assistant Professors: Mikkel Aickin [Research Specialist, Cancer Center], George H. Adams, Rena J. Gordon, Barbara R. Hartmann [Director, Navy Alcohol Drug Safety Action Program], Joel S. Meister, Janet H. Senf, Lee Sennott-Miller, Louise H. Warrick

Adjunct Assistant Professors: Clifton D. Crutchfield [Acting Director, ACOSH; Pharmacology & Toxicology], Robert W. Garrett [Psychiatry, Pharmacy Practice], James E. Sarn, Mark D. Van Ert [Health Education, Pharmacology & Toxicology, Civil Engineering]

Clinical Instructors: Cheryl E. McRill, Adele M. O'Sullivan

Research Instructor: Antonio L. Estrada

Lecturer: Karen E. Snow [Coordinator, Home Health Services]

Senior Clinical Lecturers: John T. Condon [Education Specialist, Health Education], Jerry L. Dodson, Melvin H. Goodwin, Jr., H. Winter Griffith

The Department emphasizes the values of family and community orientation to medical practice. By means of preceptorships, seminars, projects, lectures, community assignments and clinics, and in collaboration with other departments, students learn family medical practice, clinical preventive medicine, occupational medicine, and the elements of epidemiology, nutrition, public health and medical care organization.

A primary focus of activity is the development of clinical teaching service resources in the rural and urban underserved areas of the state. This is reflected in programs of preceptorships and clerkships and other educational experiences for the students and residents. Many private family physicians in the community constitute a major teaching resource and a variety of health-related institutions and programs enrich the student’s experience. The Department also collaborates with the Colleges of Agriculture, Business and Public Administration, Nursing, Pharmacy, and the School of Health Related Professions in a variety of educational, research, and service efforts.

By participation in such varied programs and experiences, the medical students and residents are encouraged to enter family practice and to set up practices in areas of need. Special emphasis is given to knowledge and achievement of comprehensive quality medical care.

In addition to the specific courses listed below, the Department participates in the interdepartmental course, Preparation for Clinical Medicine, (which includes physical diagnosis, interviewing, primary care problems, and selected seminars) and in a number of elective interdepartmental courses, many of which are open to graduate students (see Electives Manual or members of the Department).

The Department has approved residencies in Family Practice, General Preventive Medicine/Public Health and Occupational Medicine. Combined Residency programs in Family Practice and Preventive Medicine/Occupational Medicine are available. For Preventive Medicine and Occupational Medicine residents, completion of course requirement to obtain the Master of Science Degree in Exercise Physiology, Toxicology or the Master in Public Health Equivalency is required. There is also an ongoing program of continuing education for community physicians developed in close collaboration with the Arizona Academy of Family Physicians. Fellowships in faculty development, geriatrics, community medicine, nutrition, toxicology, and basic and applied research are offered.
Course Descriptions

487. **Poverty and Health (3) II GC**  
Ritenbaugh-Staff  
Study of the relationship between poverty and health. Concepts and theories from anthropology, psychology and sociology will be used to analyze problems associated with poverty. P, 6 units of Social Science. (Identical with Nurs. 487 which is home)

500. **Research (2-16) [Rpt./2] Yr.**  
Departmental Curriculum Coordinator  
Individual research not related to a thesis for an advanced degree. P, Completion of basic science courses.

588. **Clinical Anthropology (3) II**  
Ritenbaugh-Staff  
Application of principles from anthropological theory to the actual practice of patient care, with emphasis on culture content of groups living in the greater Southwest. P, 9 units of Behavioral Science. (Identical with Nurs. 588 which is home)

596. **Seminar I, II**  
Ritenbaugh-Staff

- a. International Health (3) S Open to health majors only.
- b. Epidemiologic Methods (1-3)
- g. Occupational Disease (1) II
- h. Prevention and Control of Disease (1) I
- k. Nutrition in Disease (2) [Rpt./1] P, Bioc. 501/801, Psio. 601/801
- l. Alternative Strategies for Coping With Illness: A Cross-culture View (2) II
- m. Practice of Community-Oriented Medicine in Rural Areas (2) II
- n. Community and International Nutrition (2)
- q. Occupational and Environmental Health (3) S
- r. Basic Principles of Epidemiology (3)
- t. Tropical Disease Problems (2-3)
- u. Current Issues in Health Services (2)
599. Independent Study (1-12) I,II  
Ritenbaugh-Staff  
Indepth studies of clinical and nonclinical topics.

800. Research (2-16) [Rpt./2] Yr.  
Senf-Staff  
Individual research not related to a thesis for an advanced degree. P, Completion of basic science courses.

803. Clinical Clerkship (6-9) Yr.  
Pust-Staff  
Students will develop and refine problem-solving skills in the ambulatory setting. Emphasis will be on the diagnosis and management of the illnesses presented to primary care facilities. The student will be taught to effectively use the health care team in patient assessment, and to incorporate the principles of preventive and prospective medicine into clinical practice. A life-style curriculum is integrated into the didactic presentations. This clerkship is a required course for third year medical students.

811. Subinternship  
Hale-Staff  
a. Family Medicine (4-12) [Rpt/3] Yr.  
See Electives Manual for course description.

815. Subspecialty, Yr.  
Harrison-Staff  
b. The Dying Patient (3-6) [Rpt/1] Yr.  
Tomasa  
d. Community Health Problems (3-12) [Rpt/4]  
Nichols-Vuturo-Ortiz  
g. Community Based Care of the Older Patient (3-12) [Rpt/12 units]  
Kligman  
Consult department before enrolling. See Electives Manual for course descriptions.

891. Preceptorship, Yr.  
Stein-Staff  
a. Primary Care (4-12)  
b. Family Medicine Subinternship (3-12)  
c. Epidemiology at CDC (3)  
d. Preceptorship in Rural Care (4-12)  
f. Clinical Preceptorship in International Health (6-12)  
Nichols-Pust-Staff  
See Electives Manual for course descriptions.

896. Seminar I, II  
Staff  
a. International Health (3) S  
b. Epidemiologic Methods (13) P, 896yy  
c. Approaches to Managing Behavior Problems in Children and Adolescents (2)  
f. The Doctor-Patient Relationship (2)  
l. Alternative Strategies for Coping With Illness: A Cross-Culture View (2) II  
m. Practice of Community-Oriented Medicine in Rural Areas (2) II  
n. Community and International Nutrition (2)  
q. Occupational and Environmental Health (3) S  
r. Basic Principles of Epidemiology (3)  
t. Tropical Disease Problems (2-3)  
u. Current Issues in Health Services (2)  

899. Independent Study (1-12) I,II  
Staff  
Indepth studies of clinical and nonclinical topics.
INTERNAL MEDICINE

Professors: Rubin Bressler, Head [Professor, Pharmacology; Chief, Clinical Pharmacology], David S. Alberts [Pharmacology], F. Paul Alepa, Robert A. Barbee, John T. Boyer [Family & Community Medicine; Director, Restorative Medicine], Benjamin Burrows [Chief, Pulmonary Diseases; Director, Respiratory Sciences], James J. Corrigan Jr. [Professor, Pediatrics], William F. Denny, Brian G. M. Durie [Research Associate, Cancer Center], David L. Earnest, Gordon A. Ewy, Associate Department Head [Director, Cardiac Diagnostic Laboratory; Assistant Director, Physiological Testing], Eric P. Gall [Family & Community Medicine, Surgery; Chief, Rheumatology, Allergy, & Immunology], Steven Goldman, Evan M. Hersh [Chief Hematology/Oncology], David G. Johnson [Pharmacology; Chief, Endocrinology], Murray A. Katz, Ronald J. Knudson [Associate Director, Respiratory Sciences], Michael D. Lebowitz [Associate Director, Environmental Programs, Respiratory Sciences], Frank I. Marcus, Frank L. Meyskens, Jr., [Communications; Associate Professor, Molecular & Cellular Biology; Research Professor, Family & Community Medicine], Eugene Morkin [Pharmacology, Physiology; Director, University Heart Center], Charles A. Nugent, Jr., David A. Ogden [Chief, Renal], William R. Roeske [Pharmacology], Sydney E. Salmon [Director, Cancer Center; Lecturer, Pediatrics], Jay W. Smith [Acting Associate Dean, Academic Affairs; Chief, General Medicine], Lawrence Z. Stern

Clinical Professors: Robert O. Brandenburg, Pedro Luis Escobar [Family & Community Medicine; Director, Rehabilitation Services; Chief, Physical Medicine & Rehabilitation, Restorative Medicine], John W. Heaton, Jr., William J. Howard, Brendan P. Phibbs, Robert A. Sanowski
Research Professor: Thomas E. Moon [Professor, Family & Community Medicine]
Adjunct Professor: Avery A. Sandberg
Visiting Research Professor: Ting-Sen Xu [Research Associate, Cancer Center]
Associate Professors: Thomas W. Boyden, Sammy C. Campbell, Kenneth A. Conrad [Pharmacology], Paul E. Fenster, John N. Galgiani, Ronald C. Hansen [Pediatrics], Murray Koc [Biochemistry], Stanley M. Lee [Pediatrics], Norman Levine, Thomas P. Miller [Research Associate, Cancer Center], Eskild A. Petersen [Chief, Infectious Diseases], Jacob L. Pinnas, Stuart F. Quan [Anesthesiology; Assistant Director & Research Associate, Respiratory Sciences], Richard E. Sampliner [Chief, Gastroenterology], Alexander H. Woods [Emeritus]
Research Associate Professors: Marilyn J. Halonen [Research Associate, Respiratory Sciences], Jeffrey M. Trent [Associate Professor, Radiology; Director, Basic Science Research, Cancer Center]
Visiting Associate Professor: Stanton R. Friedberg
Assistant Professors: Frederick R. Ahmann, Neil M. Ampel, Christopher P. Appleton, John W. Bloom [Research Associate, Respiratory Sciences], Marlene Bluestein [Chief, Inpatient Geriatrics], Samuel M. Butman, Anthony E. Camilli [Research Associate, Respiratory Sciences], Keith A. Comess, William S. Dalton [Adjunct Assistant Professor, Pharmacology & Toxicology], Irene E. (Libby) Edwards, Timothy C. Fagan [Pharmacology], Harinder S. Garewal [Research Associate, Cancer Center], Shoie-Kuen Huang, Karl B. Kern, Richard W. Lee, Joy L. Logan, Charles W. Otto [Anesthesiology], John D. Palmer [Associate Professor, Pharmacology], Paul J. Rutila [Coordinator, Preparation for Clinical Medicine], David S. Shimm [Assistant Professor, Radiation Oncology], John C. Stivelman, Gayle A. Traver [Associate Professor, College of Nursing], David B. Van Wyck [Surgery], David E. Yocum
Research Assistant Professors: Joseph J. Bahl [Research Scientist, University Heart Center], Brenda V. Dawson, Robert T. Dorr [Research Associate, Cancer Center, Assistant Research Professor, Pharmacology & Toxicology], Irwin L. Flink [Research Specialist, University Heart Center], Bruce E. Markham [Research Scientist, University Heart Center], Yei-Mei Peng [Research Associate, Cancer Center]; Duane L. Sherrill [Research Associate, Respiratory Sciences]
Instructor: Lee J. Hixson
Clinical Instructors: Scott B. Baron [Assistant Director, ECG Lab], Dana S. Kellis, Michael J. Maricic, John G. McGregor, Carol A. Wolfe
Research Instructors: Danetta A. Bronnimann [Research, Respiratory Sciences], Douglas A. Perednia
Lecturers: Benjamin Burbank, John G. Corcoran, David N. Flieger, Gerald B. Goldstein, Craig L. McClure, [Clinical Assistant Professor, Family & Community Medicine], Arnold B. Merin, Ulrich F. Michael, Milan V. Novak [Coordinator, Human Subjects in Research], Gail E. Riggs [Associate Director of Administration, Restorative Medicine]
Senior Clinical Lecturer: David Wayne Smith [Professor, Rehabilitation]
Clinical Lecturers: Roger A. Davis, Donald M. Megill, Gary R. Monash, Arthur B. Sanders [Associate Professor, Family & Community Medicine, Surgery], Charles J. Sanner, Tamra Whiteley-Myers

Research Lecturer: Susan E. Wilson [Associate Director, University Laboratory Animal Medicine; Research Specialist, Veterinary Pathology; Adjunct Research Specialist, Veterinary Sciences]

Assistant Clinical Lecturers: Paul D. Bozzo [Clinical Lecturer, Pathology], Alan J. Levin, Deborah S. Mendelson, Jonathan E. Schwartz, Steven M. Shaw, Brian Y. Shon, Andrew S. Tedesco

Research Associates: Leonard T. Blouin, Ellen M. Chase [Cancer Center], Kevin J. Garvey, Joan E. Laguna [Neurology, Pharmacology & Toxicology], Albert Leibovitz [Cancer Center], Rosa H. Liu [Cancer Center], Patricia A. McCuskey [Anatomy], Richard W. Pamonger, Marianne B. Powell [Cancer Center], Aurelia B. Robertone [Cancer Center], Diane H. Russell [Professor, Pharmacology, Molecular & Cellular Biology], Ronald C. Slatin [Respiratory Sciences]


Visiting Research Associates: U Kyaw Myint, Min-Jian Xu [Cancer Center]

The Department of Internal Medicine has developed a program designed to introduce undergraduate medical students to the responsibility of care of the patient. Together with the staff, students will interview and examine patients, explore what is known of the pathophysiology of the various disorders, and observe the effect of appropriate therapeutic modalities.

Course Descriptions

500. Research (6-24) [Rpt./3] Yr. Staff
555. Cancer Biology (3) II, Alternate Year, 1988-89 Bowden-Gerner
   (Identical with M. Mic. 555 which is home)
596. Seminar, II Staff
   a. Pathophysiology and Immunology of the Clinical Manifestations of Coccidioidomycosis (2) Galgiani
599. Independent Study (3-6) I, II Staff
800. Research (3-30) [Rpt./30 units] Yr. Staff
   See Electives Manual for course description.
803. Clinical Clerkship (12) Yr. Barbee-Staff

Required of all students during their first clinical year. Assignment is made to the inpatient medical wards at AHSC, Tucson Veterans Administration Medical Center and selected hospitals in Phoenix. Emphasis is placed upon the development of clinical skills and problem solving. Students are expected to obtain and record the complete medical histories, perform physical examinations, develop appropriate differential diagnoses and monitor the progress of assigned patients. They will participate in diagnostic and therapeutic procedures with other members of the patient care team, and attend required departmental conferences and seminars.
Clerkship, Yr.  
- Ambulatory Diagnosis and Therapeutics (6) Yr.
- Geriatrics and General Medicine Extended Care (3-12) Yr.
- Ambulatory Geriatrics (3-12) Yr. P, 803
  Students are offered three to twelve week elective clerkships in hospitals in Tucson and Phoenix.
  See Electives Manual for course descriptions.

Subinternship, Yr.  
- Internal Medicine (4) Yr.
- Intensive Care Subinternship (4) Yr.
- Coronary Care Unit (4) Yr.
- Medical Intensive Care Unit (4) Yr.
- General Medicine (4) Yr.

Subspecialty, Yr.  
- Clinical Cardiology (4-8)
- Clinical Dermatology (3)
- Endocrinology (4-12)
- Clinical Gastroenterology (4-8)
- Hematology-Oncology (3-4)
- Infectious Diseases (4-12)
- Pulmonary Diseases (4)
- Pulmonary Laboratory and Consultation Service (3-6)
- Nephrology, Renal Disease (3-6)
- Clinical Allergy (4-6) P, 803 (Identical with Ped. 8151)
- Medical Subspecialties (3-6) [Rpt./1] Yr.
- Physical Medicine and Rehabilitation (3-6) [Rpt./1] Yr.
- Critical Care Medicine (4-6) (Identical with Anes. 815p which is home)
- Cardiology Consultation (4) Yr.
- Neurological and Neuromuscular Disorders (3-6) P, 803.
- Rheumatology (4-6) P, 803.
  See Electives Manual for course descriptions.

Preceptorship  
- General Medicine and/or Subspecialties (3-12) [Rpt./2]
- Ambulatory Internal Medicine: Clinical Problems (6) Yr.
  See Electives Manual for course descriptions.

Seminar, II  
- Pathophysiology and Immunology of the Clinical Manifestations of Coccidioidomycosis (2)
  Galgiani
  See Electives Manual for course description.

Independent Study (1-18) I, II  
- Staff
  See Electives Manual for course description.
UNIVERSITY DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY
(Colleges of Agriculture and Medicine and the Faculty of Science)

Professors: Harris Bernstein, Associate Head, Evan Hersch [Chief, Hematology/Oncology, Cancer Center], Junetsu Ito, Wayburn S. Jeter [Pharmacology & Toxicology; Director, Cellular Immunology Laboratory], Henry Koffler [Biochemistry, Molecular & Cellular Biology; President, University of Arizona], Peter P. Ludovici [Emeritus], William J. Meinke, George B. Olson, Kenneth J. Ryan [Pathology], John Spizizen, [Emeritus], Irving Yall [Emeritus]

Associate Professors: Norval A. Sinclair, Acting Head, Charles P. Gerba [Nutrition & Food Science], Robert J. Janssen, James T. Sinski

Research Associate Professors: Carol Bernstein, Marilyn J. Halonen [Associate Professor, Pharmacology; Research Associate, Respiratory Sciences]

Assistant Professor: Richard L. Friedman

Research Assistant Professors: Andrea H. Hubbard [Research Associate, Anesthesiology; Research Assistant Professor, Pharmacology & Toxicology], Eileen M. Jablonka, Geraldine C. Meinke, Philip Scuderi, Jr. [Research Associate, Cancer Center]

Research Instructors: Judy Bradshaw, Vivian E. Oage [Laboratory Teaching Coordinator, Multidiscipline Laboratories]

Graduate study in Microbiology and Immunology is concerned primarily with microbial structures and functions, as well as the nature of immune systems. Areas of current research emphasis are virology, microbial genetics, immunology, bacterial pathogenesis, and environmental microbiology. Course programs are drawn from offerings in biochemistry, biological sciences, chemistry, mathematics, microbiology, molecular biology, anatomy, pharmacology, genetics, and others.

Master of Science and Doctor of Philosophy degrees with a major in microbiology and immunology are offered by a program whose faculty includes members of the Department of Microbiology and Immunology and other departments in the University.

Some limitations of enrollments may be necessary. Medical students will be given preference in those courses that are required for the M.D. degree. All other students must obtain the permission of the instructor before enrolling.

Course Descriptions

428R. Advanced Microbial Genetics (3) GC II Mendelson
Modern concepts of microbial genetics; basic genetic theory, the molecular architecture, biosynthesis and genetic regulation of bacterial cell structure, control of growth and cell division. P, 103, Micr. 328, G.Bio. 320 or 321. (Identical with M.C.B. 428R)

428L. Advanced Microbial Genetics Laboratory (2) GC II Mendelson
Individual research projects within the framework of microbial genetics, with emphasis on the genetic system of Bacillus subtilis. P, CR 428R. (Identical with M.C.B. 428L)

501. Medical Microbiology (6) I Staff
The biological characteristics of microorganisms of importance in human health and disease; the reaction of the host to infectious agents and the mechanisms of host defense; diagnosis and management of infectious disease. Lectures, discussions, demonstrations, and laboratory experiments. P, G. Bio. 101b; Chem. 241b, 243b; Bioc. 501.

530. Biophysical Theory (2) II I Kilkson
Physical concepts and theories describing biomolecular structure and function, molecular evolution, limits to structure, symmetry, oligomer and virus structure, organelle structure and function. (Identical with Phys. 530)

550. Molecular Mechanisms of Microbial Pathogenesis (3) I 1988-89 Friedman
Review of current concepts in specific areas of microbial pathogenesis, including actions of exo- and endotoxins, cell surface interactions, phagocytosis and host microbicidal functions. P, Bioc. 460. (Identical with Micr. 550)
551. **Environmental Carcinogenesis (3) II 1987-88**
   
   Gerner
   
   Physical and chemical carcinogenesis. Special emphasis will be upon molecular aspects of the interaction of the carcinogenic agents with mammalian cells and the subsequent mutagenic and metabolic consequences of such interactions. Topics of metabolic activation of chemical carcinogens will be emphasized as well as biological and biochemical aspects of tumor initiation and promotion. Carcinogen testing and risk-benefit analysis in relationship to the human environment.

555. **Cancer Biology (3) II 1988-89**
   
   Bowden
   
   Fundamental biological aspects of neoplastic growth at the organ, cellular and molecular levels. Emphasis on the etiology, behavior and therapy of neoplasms. (Identical with R.Onc. 555)

560. **Structure and Function of the Immunoglobulins (3) II 1987-88**
   
   G. Meinke
   
   Immunoochemical characterization of the isotypic, allotypic and idiotypic specificities of the immunoglobulins and their relationships to biological function. P, Bioc. 462a-462b.

561. **Immunobiology (3) I, II 1988-89**
   
   G. Meinke
   
   Cells and cellular events involved in humoral and cell-mediated immune responses; morphologic, physiologic and biochemical characterizations of the lymphoreticular system. P, Bioc. 462a-462b.

570. **Molecular Genetics (3) I 1987-88**
   
   H. Bernstein
   
   Molecular genetics and biology of the bacterial viruses; molecular mechanisms of gene regulation, DNA replication, DNA repair, mutation and genetic recombination; current research in bacterial genetics (lysogeny, transduction, conjugation, use of transposons and gene fusions in genetic analysis and transformation); introduction to gene cloning and its uses in analysis of gene structure and regulation.

571. **Molecular Gene Cloning (3) II 1988-89**
   
   Ito
   
   Current gene cloning technology; restriction endonucleases, cloning vehicles (plasmid vectors, bacteriophage vectors, and single-stranded phage vectors), gene amplification and expression of cloned genes.

577. **Advanced Microbial Physiology (2) I 1987-88**
   
   Zucker

580. **Molecular Virology (3) II 1987-88**
   
   W. Meinke
   
   The current status of basic research in virology at the molecular level. P, Chem. 460.

595. **Colloquium I**
   
   a. Molecular Biology (1) I [Rpt./2]
   
   Seminar
   
   a. Current Problems in Molecular Biophysics (1) I, II (Identical with Phys. 596a which is home)
   
   b. Control of Proliferation in Animal Cells (1-2) I (Identical with R.Onc. 596h which is home)
   
   Gerner

630. **Immunology (4) II 1987-88 I**
   
   Olson
   
   Immunological and immunochemical concepts and techniques. 2R, 6L. P, twelve units of Micr., Chem. 460 or N.F.S. 406a.

695. **Colloquium**
   
   a. Readings in Microbiology (1) [Rpt.] I, II
   
   b. Immunopathology (1) II
   
   c. Molecular Genetics of Microorganisms (1) I, II
   
   d. Molecular and Cellular Immunology (1) I
   
   Bernstein
   
   Friedman

696. **Seminar**
   
   a. Research Seminar (1) [Rpt.] I,II
   
   Joens-Friedman

801. **Medical Microbiology (6) I**
   
   Staff
   
   The biological characteristics of microorganisms of importance in human health and disease; the reaction of the host to infectious agents and the mechanisms of host defense; diagnosis and management of infectious disease. Lectures, discussions, demonstrations, and laboratory experiments. P, G. Bio. 101b; Chem. 241b, 243b; Bioc. 501.

891. **Preceptorship, Yr.**
   
   a. Microbiology and Immunology (3-12)
   
   See Electives Manual for course description.

899. **Independent Study (6-12) I, II**
   
   Staff
   

900. **Research (1-8) I, II**
   
   Staff

910. **Thesis (1-8, max. total 8) I, II**
   
   Staff

920. **Dissertation (1-9) I, II**
   
   Staff

930. **Supplementary Registration (1-6) I, II**
   
   Staff
The Department of Molecular and Cellular Biology is a research-oriented department in which students may receive advanced training in all aspects of research which employ cellular, molecular, biochemical, and genetic approaches. The department offers programs leading to the Master of Science and the Doctor of Philosophy degrees with majors in Molecular and Cellular Biology.

Applicants for admission should be prepared in chemistry, physics, and mathematics and must submit scores on the aptitude test of the Graduate Record Examination. Applicants should communicate directly with the department regarding other admission requirements.

The deadline for completion of all application files for admission to the programs beginning with the fall semester is April 1st (March 15th for applicants desiring financial assistance).

Students are expected to specialize in areas of interest to the faculty. These include viral oncology, regulation of gene expression, neurobiology of simple systems, cellular ultrastructure and function, structure and function of nucleic acids, developmental biology of higher plants, plant molecular biology, molecular genetics, invertebrate developmental biology, environmental plant physiology, and gene transfer systems for mammalian cells. A listing of the faculty of the department and their research interests can be obtained from the department on request. A thesis is required for the Master's degree.

Course Descriptions

404. Contemporary Biology and Human Affairs (3) GC II Aposhian
Advances in biomedical research will be reviewed and their ethical, social, and legal implications discussed. P, one course in bioc. or bio.; botany not acceptable.

410a. Advanced Cell Biology (3-3) GC Ferris-Staff
410b. Regulation at the cellular and molecular levels; gene expression; nature, function, and integration of organelles and ultrastructural components of the cell. P, 181. (for majors), Chem. 241b or 480a (Identical with Micr. 410a-410b)

412. Radioisotopes in Biology (3) GC I Keck
Advanced techniques in the application of radioactive tracers to problems of molecular biology; kinetics of labeling, fractionation procedures; detection systems and processing of data. P, Chem. 103b, 104b, Phys. 102a-102b.
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>413</td>
<td>Advanced Cell Biology Laboratory (2) GC I</td>
<td>Shimizu</td>
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<tr>
<td></td>
<td>Modern lab techniques for genetic and molecular analyses of mammalian cells in culture.</td>
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<td>P, CR 415.</td>
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<tr>
<td>415</td>
<td>Somatic Cell Genetics (2) GC I</td>
<td>Shimizu</td>
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<td></td>
<td>Modern concepts of eucaryotic cell genetics and molecular mechanisms of cell growth control.</td>
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<tr>
<td>416</td>
<td>Physical Methods in Cell Biology (3) GC II</td>
<td>Keck</td>
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<tr>
<td></td>
<td>Physical principles underlying the characterization of subcellular structures and macromolecules.</td>
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<td></td>
<td>P, Math. 125b.</td>
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<tr>
<td>417</td>
<td>Computer Biology Data Analysis (3) GC I</td>
<td>Keck</td>
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<tr>
<td></td>
<td>Processing of analytical data for solutions to problems in biology.</td>
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<td>P, Math. 125b.</td>
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<tr>
<td>428R</td>
<td>Advanced Microbial Genetics (3) GC II</td>
<td>Mendelson</td>
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<tr>
<td></td>
<td>Modern concepts of microbial genetics; basic genetic theory, the molecular architecture, biosynthesis and genetic regulation of bacterial cell structure, control of growth and cell division.</td>
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<td>P, 181, Micr. 328, col. 320 or 321. (Identical with Ecol. 428R and Micr. 428R)</td>
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<td>428L</td>
<td>Advanced Microbial Genetics Laboratory (2) GC I</td>
<td>Mendelson</td>
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<td></td>
<td>Individual research projects within the framework of microbial genetics, with emphasis on the genetic system of Bacillus subtilis. (Identical with Ecol. 428L and Micr. 428L)</td>
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<td>456</td>
<td>Developmental Biology (3) GC I</td>
<td>Bagnara</td>
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<td></td>
<td>Principles of development. 3R, P, 181. (Identical with Anat. 456)</td>
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<tr>
<td>457</td>
<td>Experiments in Developmental Biology (4) GC II</td>
<td>Bagnara</td>
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<tr>
<td></td>
<td>Experimental analysis of the principles of development. 2R, 6L. P, 456, Chem. 241b. (Identical with Anat. 457)</td>
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<td>460</td>
<td>Plant Physiology (4) GC I</td>
<td>Matsuda</td>
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<td></td>
<td>Introduction to water relations, photosynthesis, respiration, growth and development of higher plants. 3R, 3L. P, Chem. 241a. 243a. (Identical with Ecol. 460)</td>
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<tr>
<td>461</td>
<td>Introduction to Neurobiology (3) GC I</td>
<td>Pickens</td>
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<td></td>
<td>Physiology and anatomy of invertebrate and vertebrate nervous systems. P, eight units of biology.</td>
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<tr>
<td>462</td>
<td>Neurobiology Laboratory (1) GC1</td>
<td>Pickens</td>
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<tr>
<td></td>
<td>Techniques in neurobiology. P, CR</td>
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<tr>
<td>463a-</td>
<td>Human Physiology Laboratory (1-1) GC</td>
<td>Staff</td>
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<tr>
<td>463b</td>
<td>(Identical with Ecol. 464aL-464bL)</td>
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<tr>
<td>464a-</td>
<td>Human Physiology (3-3) GC</td>
<td>Staff</td>
</tr>
<tr>
<td>464b</td>
<td>(Identical with Ecol. 464aR-464bR)</td>
<td></td>
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</table>
465. Neuroethology (2) GC II.  
   Pickens  
   Selected topics in current neuroethological research on vertebrate and invertebrate nervous systems. P. 461 or consult department before enrolling.

467R. Endocrinology (3) GC II  
   Hadley  
   (Identical with Anatomy 467R)

467L. Endocrinology Laboratory (1) GC II  
   Hadley  
   (Identical with Anatomy 467L)

469. Developmental Neurobiology (2) GC II  
   Pickens  
   Development of the nervous systems of invertebrates and vertebrates from embryonic stages to the adult. P, 8 units of bio.

473. Recombinant DNA Techniques (3) GC II  
   Lindell  
   Relevant techniques for the isolation, purification, and cloning of genes in E. Coli hosts. Cloned DNA will be characterized by restriction mapping and hybridization techniques. Consult department before enrolling. P, Bioc. 462a, M.C.B. 410b. (Identical with Bioc. 473 and Micr. 473)

514. Supramolecular Structure (2) II 1988-89  
   Chiu  
   Application of diffraction techniques in the study of structure and function of biological macromolecules.

550. Topics in Pigment Cell Biology (2) I  
   Bagnara  
   (Identical with Anatomy 550)

555. Molecular Mechanisms of Development (3) II  
   Brower  
   Detailed examination of molecular, genetic and cellular approaches to selected problems in developmental biology. P, consult department before enrolling. (Identical with Bioc. 555, Gene. 555)

558. Advanced Subjects in Endocrinology (2) [Rpt.] I  
   Hadley  
   Selected topics in vertebrate and invertebrate endocrinology. P, 467R. (Identical with Anatomy 558)

562. Plant Intermediary Metabolism (3) II 1988-89  
   Matsuda  
   Selected topics in plant metabolism and photosynthesis. P, 460. (Identical with Pl.S. 562)

563. Plant-Water Relations (3) II  
   O'Leary  
   Analytic approach to the study of water movement into and through plants; development of internal water deficits and their significance to physiological processes. P, 460. (Identical with Ws.M. 563)

564. Plant Growth and Development (3) II 1987-88  
   Matsuda  
   Selected topics in growth and development. P. 460 (Identical with Pl.s. 564)

568a. Nucleic Acids (3-3) 1987-88  
   Staff

568b.  
   (Identical with Bioc. 568a-568b)

570. Molecular Biology of the Cell Membrane (3) I 1988-89  
   Staff  
   (Identical with Bioc. 570)

595a. Colloquium (1) [Rpt.] II  
   Staff  
   Topics of interest in molecular and cellular biology. Open to majors only.

696. Seminar (1) [Rpt.] I, II  
   Staff

761. Methods in Molecular and Cellular Biology (3) I,II  
   Staff  
   Current techniques for qualitative and quantitative studies. 9L. Open to majors only.
Professors: Alan B. Rubens, Head, Peggy C. Ferry [Associate Head, Pediatrics; Chief, Pediatric Neurology], William A. Sibley
Clinical Professor: Harvey W. Buchsbaum
Associate Professors: Colin R. Bamford [Associate Head; Director, Diagnostic Neurology], Jose F. Laguna
Assistant Professors: William Feinberg, Eugenie A. Obbens, Steven Z. Rapscak
Clinical Assistant Professors: Enrique L. Labadie, Kalarickal J. Oommen
Clinical Instructor: Jeannette K. Wendt
Lecturer: Jay B. Angevine, Jr. [Professor, Anatomy]
Research Associate: Joan E. Laguna [Internal Medicine, Pharmacology & Toxicology]
Clinical Scientist: Stuart R. Snider

Neurology is that discipline of medicine responsible for the diagnosis and treatment of diseases of the human nervous system. Courses are offered which are designed to teach students to interpret evidence of normal or abnormal neurologic functioning. Students have a three-week required clerkship and a six-week elective in neurology. Students receive an introduction to neurology during lectures in the neuroscience course during the basic science years.

A continuing neuroscience seminar series is presented by residents, physicians, and graduate students in the Department of Neurology throughout the year. This series is offered to medical students as well as to postgraduate trainees and students in allied areas.
Course Descriptions

800. Research (6-24) [Rpt./3] Yr.
See Electives Manual for course description.

803. Clinical Clerkship (3-6) Yr.
A three-week required course on the neurological wards at University Medical Center, Tucson Medical Center, Tucson Veterans Administration Medical Center, Kino Community Hospital and Barrow Neurological Institute in Phoenix. Cases are presented to members of the neurological staff and discussed in detail. Weekly teaching conferences are given by the neurology faculty.

810. Clerkship, Yr.
  a. Neurology (3-6) Yr.
  This three-, four-, or six-week clerkship is offered on the neurology wards at University Medical Center, Tucson Medical Center, Tucson Veterans Administration Medical Center, and Kino Community Hospital. Students work closely with the attending and resident staff in an effort to become proficient in the techniques of the neurological examination and management of neurological disorders. P, 803.

891. Preceptorship, [Rpt./2] Yr.
  a. Neurology (4-6) [Rpt./2] Yr.
  See Electives Manual for course description.
OBSTETRICS AND GYNECOLOGY

Professors: C. Donald Christian, Head [Anatomy], John R. Davis [Pathology], Jack W. Pearson [Director], Lewis S. Shenker [Associate Head]
Clinical Professors: John V. Kelly, Tawfik H. Rizkallah
Associate Professors: Diane S. Fordney [Psychiatry], William C. Scott, Louis Weinstein [Director, Perinatology]
Clinical Associate Professor: Earl A. Surwit [Surgery]
Associate Professors: Silvio A. Aristizabal [Associate Professor, Radiology], Kathryn L. Reed
Clinical Assistant Professors: Joel M. Childers, Stephen C. Green, Allan R. Hartsough, Herbert E. Pollock [Co-Coordinator, Human Behavior & Development], Bruce E. Silva
Research Assistant Professor: David S. Grosso
Clinical Instructor: Steven E. Calvin
Lecturer: Caroline F. Anderson
Senior Clinical Lecturers: Walter B. Cherny, Girgis Mikhail
Genetic Counselor: Lisa Broeker, M.S.

Obstetrics and Gynecology is that discipline of medicine which encompasses reproductive biology and the ultimate application thereof to human reproduction. In the natural evolution of medical care in the United States the obstetrician-gynecologist has become the primary physician for women. The courses of study available in Obstetrics and Gynecology are designed to provide a clinical substrate for the medical student in this branch of medicine. The means to this end are by precept and example of patient diagnosis, care and therapeutics as well as didactic and tutorial sessions.

Course Descriptions

800. Research (1-18) [Rpt./1] Yr.
   Experience in each of the research areas listed below is available with programs up to six weeks in length individually designed. P, Ob.G. 803.
   1. Reproductive Pharmacology
   2. Diagnostic Ultrasound
   3. Endocrine Laboratory
   4. Perinatal Medicine
   5. Gynecologic Oncology
   6. Infertility/Fertility Control
   7. Gynecology/Obstetrics

803. Clinical Clerkship (6-9) Yr.
   Medical students will be assigned to outpatient clinics and hospital wards to become members, along with the attending physician, of the team responsible for the patient's care.

810. Clerkship, Yr.
   a. Preparation for Practice (4-6)
   This elective course for Year IV students will essentially be an externship in a Phoenix or Tucson hospital to include exposure to the full gamut of obstetrical and gynecological care, conducted under direct supervision of a faculty member. The elective period may be for three or six weeks. P, 803.
   b. Preparation for Private Practice (3-6)
   This elective course for Year IV students is to provide patient care experience in a rural and/or underserved area of Arizona. Closely supervised preceptorship in Ob/Gyn in a private practice setting removed from the University.

815. Subspecialty, Yr.
   a. Clinical Infertility (4-6) Yr.

891. Preceptorship (3-12) Yr.
   a. Obstetrics and Gynecology (3-6)
   b. Gynecology-Endocrinology (3-6)
   See Electives Manual for course descriptions.
OPHTHALMOLOGY

Professor: Barton L. Hodes, Head
Associate Professor: Johan T. W. van Dalen
Clinical Associate Professors: Robert M. Dryden, John Edward Harris, Byron M. Weisbaum
Assistant Professors: Sam E. Sato [Pediatrics], Kenneth B. Simons [Pathology]
Assistant Clinical Lecturers: Ronald W. Barnet, Jeffrey P. Edelstein, John M. Lewis
Associates: Harold E. Cross, Jeffrey P. Edelstein, Barry Kusman, George S. Novalis, Harry D. Schlosser

Ophthalmology, the College of Medicine's newest department, offers two electives for medical students. One is a research elective in which experience in laboratory research in ophthalmology will be obtained with programs of a minimum of six weeks in duration. The other is a clinical elective in which medical students will be assigned to outpatient clinics and inpatient wards at University Medical Center, Tucson Veterans Administration Medical Center and Kino Community Hospital, as well as surgery which will give them an overview as to how the ophthalmologist relates to his patient population.

The graduate program in Ophthalmology offers residents extensive inpatient and outpatient experiences at the University Medical Center, Tucson Veterans Administration Medical Center and Kino Community Hospital.

Course Descriptions

800. Research (6-18) I, II
     See Electives Manual for course description.

815. Subspecialty, Yr. [Rpt./3]
     a. Ophthalmology (3-6) Yr.
        See Electives Manual for course description.

891. Preceptorship I, II
     a. Ophthalmology (4-12)
        See Electives Manual for course description.
The Department of Pathology has responsibility for both anatomical and clinical pathology. The objective of the study of pathology is to gain increased understanding of disease—the causes, mechanisms, and secondary alterations which occur in body structure and function—exploiting whatever methods will provide the physician with a solid body of facts from which to reason, deduce, and prognosticate.

**Course Descriptions**

489. Introduction to Forensic Science: Pathology, Anthropology, Toxicology and Law (2) GC I, II  
**Birkby-Jones-Henry-Parks**  
The course provides opportunity for the criminal investigator and attorney with a background in forensic pathology to better understand the end results of trauma, toxic substances and environmental catastrophes.

801. General and Systemic Pathology (10) I, II  
**Layton-Staff**  
Lectures, conferences, demonstrations, and laboratory investigations relating to disease. Use of current autopsy, biopsy, and clinical pathology material. P, Anat. 801, 802, 805; Biochem. 501/801; Physiol. 601/801; M. Mic. 801 (medical) or CR; Phcl. 501/801 or CR; Med. 801 or CR.

810. Clerkship, Yr.  
a. Anatomic Pathology (4-6) Yr.  
An intern type program with students participating in surgical pathology, autopsies, and cytology analysis. Instruction is strongly clinically oriented. P, Path. 801 and twelve weeks of clinical clerkships.

b. Clinical Pathology (4) Yr.  
An interpretive approach to the evaluation of laboratory data in the diagnosis and management of clinical disorders. Topics include bacteriology, blood component therapy, body fluid analysis, clinical chemistry, coagulation, hematology, immunohematology, mycology, toxicology, urinalysis and virology. P, Path. 801 and twelve weeks of clinical clerkships.

c. Special Topics (3-18) [Rpt.] Yr.  
Opportunities for intensive studies during a six-week period in one of the following fields: computer use, cytogenetics, immunohematology, immunopathology, microbiology-virology, neuropathology, pulmonary pathology, hematopathology, clinical chemistry, and oncology. May be taken more than once for credit. P, Path. 801, and prior arrangement and approval by the department.

891. Preceptorship, Yr.  
a. Pathology (3-18) [Rpt./2]  
Professors: Lynn M. Taussig, Head [Medical Director, Children's Research Center; Assistant Director, Respiratory Sciences], Hugh D. Allen [Assistant Head; Assistant Director, Echo-Phone Lab], George D. Comerci [Family & Community Medicine; Chief, Adolescent Medicine], James J. Corrigan, Jr. [Internal Medicine; Chief, Hematology/Oncology/ Rheumatology], Burris R. Duncan [General Pediatrics], Peggy C. Ferry [Associate Head; Neurology; Chief, Pediatric Neurology], Vincent A. Fulginiti [Acting Dean, Vice Dean, College of Medicine], Stanley J. Goldberg [Chief, Cardiology], Marilyn J. Heins [Vice Dean, College of Medicine], Otakar Koldovsky [Physiology; Chief, Perinatal & Nutritional Sciences], Richard J. Lemen [Chief, Pulmonary; Assistant Professor, Physiology; Research Associate, Respiratory Sciences], Elmer S. Lightner [Chief, Endocrinology], C. George Ray [Pathology; Chief, Infectious Diseases], Hugh C. Thompson [Emeritus, Family & Community Medicine]

Clinical Professors: Anna Binkiewicz, Melvin L. Cohen, Michael S. Kappy, Daniel F. Reardon

Associate Professors: Sergio A. Bustamante, Gail G. Harrison [Professor, Family & Community Medicine; Associate Professor, Nutrition & Food Science, Anthropology], Ronald C. Hansen [Internal Medicine], John J. Hutter, Jr., Stanley M. Lee [Internal Medicine], Michael J. Schumacher [Chief, Allergy], Elsa J. Sell [Neonatology], Alayne Yates [Professor, Psychiatry], John N. Udall [Chief, Gastroenterology]

Clinical Associate Professors: Paul S. Bergeson, John K. Charlton, Michael W. Cohen, William Daily, Jr., M. Eleanor Grimm, Montgomery C. Hart, H. Belton Meyer, Marian E. Molthan, Michael S. Radetsky, Mary E. Rimsza

Assistant Professors: Alan D. Bedrick, John R. Britton, Richard L. Donnerstein, Carlos A. Flores, Gerald R. Marx, Paul S. Meltzer [Research Associate, Cancer Center], Paul F. Pollack, Sam E. Sato [Ophthalmology], Ziad M. Shehab, Rickey L. Williams


Research Assistant Professors: Wayne J. Morgan [Physiology], Anne L. Wright [Research Associate, Respiratory Sciences]

Instructors: Sanford C. Newmark, Michele Raddish

Lecturers: Victor A. Elsberry [Instructor, Pharmacy Practice], Fran Z. Farrell, Sydney E. Salmon [Director, Cancer Center; Professor, Internal Medicine; Chief, General Pediatrics], Mary Ann Martinez

Senior Clinical Lecturers: Eric H. Cramer [Clinical Lecturer, Family & Community Medicine], Buchanan M. McKay [Clinical Lecturer, Family & Community Medicine]

Clinical Lecturers: Robert C. Cannell, Ronald S. Fischler [Family & Community Medicine], Harvey G. Goodman [Neurology], Maureen J. Hutter [Psychology], Deborah A. Icenogle

Assistant Clinical Lecturers: Brian P. Hagerty, M.D., Mitchell D. Shub

Research Associates: Radhakrishna Rao, Jane R. Ruggill, Cao Xiaoling

The unique concerns of pediatrics as a medical discipline are: 1) the period of life between conception and the first month of life, loosely termed perinatology; 2) the fact that children are growing and developing constantly, which results in unique physiological, biochemical, pathological, and psychosocial considerations; and 3) the period of life known as adolescence, with its characteristic physiologic and psychologic changes. The objectives of the department are to provide all students of medicine, from freshmen in medical school to the accomplished physician, an opportunity to learn of our best understanding of health and disorders in relation to the above concerns. We also have as a goal the contribution of new knowledge by appropriate research activities and the application of all available knowledge by models of health care. These objectives are achieved by the courses listed below, by active participation in regular postgraduate programs, and by the research and clinical activities in the department.
Course Descriptions

800. Research (4-6) Yr.  

803. Clinical Clerkship (6-9) Yr.  
Williams-Ruggill
This six week clerkship is required of all students in their initial clinical year; an additional three weeks may be selected. Stress is placed upon acquisition and refinement of basic data collection, upon problem solving and accumulation of factual knowledge, and achieving those attitudes associated with being a physician.

810. Clerkship, Yr.  
a. Externship in Inpatient Pediatrics (4-6)  
d. Inpatient Pediatrics (4) Yr.  

811. Subinternship, Yr.  
a. Ambulatory Pediatrics (3-6) Yr.  
d. Adolescent Medicine (4-6)  

815. Subspecialty, Yr.  
a. Advanced Neonatology (4-6) Yr.  
b. Pediatric Infectious Diseases (4-6) Yr.  
c. Neurodevelopmental Follow-up of High Risk Infants (4) Yr.  
d. Cardiac Ultrasound Echo & Doppler (4-6) Yr.  
e. Pediatric Cardiology (4-6) Yr.  
f. Pediatric Neurology (4-6) Yr.  
g. Pediatric Hematology/Oncology (4-6) Yr.  
h. Poison Center (4-12) Yr.  
l. Clinical Allergy (4-6) Yr. (Identical with I. Med. 8151, which is home)  
p. Pediatric Endocrinology (4-6) Yr.  
r. Pediatric Clinical Research in a Cross-Cultural Setting (4) Yr.  
s. Medical Genetics/Dysmorphology (4) Yr.  
These four to twelve-week elective courses are organized by various staff and sections of the Department of Pediatrics. See Electives Manual for course descriptions. P, 803.

891. Preceptorship, Yr.  
a. Pediatrics (4-6) Yr.  

899. Independent Study (3-18) Yr.  
See Electives Manual for course description.
PHARMACOLOGY

Professors: Thomas F. Burks II, Head [Associate Dean, Research]; David S. Alberts [Internal Medicine]; H. Vasken Aposhian [Molecular & Cellular Biology]; Klaus Brendel, Rubin Bressler [Head, Internal Medicine; Chief, Clinical Pharmacology]; Burnell R. Brown, Jr. [Head, Anesthesiology]; Ryan J. Huxtable, David G. Johnson [Internal Medicine]; Eugene Morkin [Internal Medicine, Physiology; Director, University Heart Center]; Charles W. Putnam [Associate Head, Surgery]; William R. Roeske [Internal Medicine]; Diane H. Russell [Molecular & Cellular Biology; Research Associate, Internal Medicine]; I. Glenn Sipes [Anesthesiology; Head, Pharmacology & Toxicology]; Henry I. Yamamura [Biochemistry, Arizona Research Laboratories; Associate Professor, Psychiatry];

Visiting Professor: Bernard B. Brodie

Associate Professors: Dean E. Carter [Pharmacology & Toxicology]; Kenneth A. Conrad [Internal Medicine]; Thomas P. Davis, Marilyn J. Halonen [Research Associate Professor, Microbiology & Immunology; Research Associate, Respiratory Sciences]; David L. Kreulen, Thomas J. Lindell [Acting Head, Molecular & Cellular Biology]; John D. Palmer [Assistant Professor, Internal Medicine]

Research Associate Professors: Raymond C. Duhamel, Thomas L. Smith

Assistant Professors: Timothy C. Fagan [Internal Medicine]; Laurel A. Fisher, A. Jay Gandolfi [Anesthesiology; Research Assistant Professor, Pharmacology & Toxicology]; Frank Porreca

Research Assistant Professors: John J. Duffy [Radiation Oncology], Ronald J. Lukas

Adjunct Assistant Professor: Siraj I. Mufti [Research Associate, Pharmacology & Toxicology]

Instructor: Alan D. Barreuther [Clinical Associate Professor, Pharmacology & Toxicology]

Research Associates: A. Duane Anderson [Pathology]; Mary S. Conners, Mary V. Fox [Psychiatry; Psychology]; Yutaka Fujiwara, Rajash Handa, Masaaki Ikeda, Richard J. Knapp [Respiratory Sciences]; Thomas H. Kramer, Steven G. Matsumoto [Physiology]; David W. Montgomery [Research Assistant Professor, Surgery]; J. Michael Overton, Russell J. Sheldon, Jian-Xin Wang

Visiting Scientist: Shizuo Yamada

Pharmacology is a broad discipline involving the investigation of the actions of drugs and chemicals upon living material at all levels of organization. The discipline occupies an important interface between the basic medical sciences and the clinical sciences, drawing strongly upon the former for its contribution to the latter. In the health professions pharmacologic knowledge is applied to the diagnosis, prevention, cure or relief of symptoms of disease, and in the promotion of optimal health. The basic pharmacologic principles are emphasized in both the medical and undergraduate student teaching. This will permit the student to develop techniques of problem solving to keep abreast of advances in pharmacology through his/her professional career.

Course Descriptions

501. The Pharmacological Basis of Therapeutics (6) II Palmer Action of chemical agents upon living material at all levels of organization, with emphasis on mechanisms of action of prototype drugs. Foundation for a rational approach to human therapeutics and toxicology. P, Psio. 601; Bioc. 501/801. (Identical with Tox. 501)


550. Drug Disposition and Metabolism (2) II Brendel-Gandolfi Principles of absorption, distribution and excretion of drugs, with particular emphasis on mechanisms of drug metabolism and pharmacokinetics. P, 462a, b, or 501, Bioc. 501/801, Tox 602a. (Identical with Tox. 550)
551. Molecular Biology of Pharmacological Agents (3) I
1987-88, Alternate Year  Lindell-Russell
The molecular mechanism of drugs and toxins at the cellular and subcellular levels, including
effects on control mechanisms, cell-cell interactions, organelles, and nucleic acid and protein

554. Cardiovascular Pharmacology (3) I  Huxtable-Fisher
Modern theories of mechanism of action of cardiovascular drugs, therapy of cardiovascular

561a- Introduction to Pharmacological and
561b. Toxicological Literature (1-1)  Yamamura
Designed to broaden the background of students in pharmacology and toxicology, and to
improve scientific communication skills. P, 501 (Identical with Pcol. 561a-561b)

576. Environmental Toxicology (3) I  Staff
Toxicity of natural toxins and of agricultural and industrial chemicals with emphasis on air
and water pollutants; decision-making in environmental issues. P, 6 units of bio. and organic
chem.; Chem. 325, 326. (Identical with Tox. 576 which is home)

586a- Introduction to Pharmacology and Toxicology Research (1-1)  Staff
586b.
Introduction to basic research techniques in pharmacology and toxicology through super-
vised laboratory rotations; student-initiated and faculty-structured laboratory exercises in

596. Seminar (1-3) [Rpt./3] I, II  Staff
Student reports on current research topics by local and visiting scholars. Required of all
predoctoral graduate students in Pharmacology and Toxicology.

597. Advanced Graduate Research (1-3) [Rpt./] I, II
Required of all graduate students once per year after the first year. P, 561b. (Identical with
Pcol. 596a)

599. Independent Study (1-5) I, II  Staff
See Electives Manual for course description.

601. Analytical Toxicology (2-3) I  Carter
Lecture and lab in the qualitative and quantitative determination of toxic substances in body
fluids. Modern instrumental techniques will be employed whenever appropriate. Lecture may
be taken separately by non-majors. 2R, 4L. P, Chem. 400a. (Identical with Tox. 601 which is home)

602. Biotoxicology (2-3) II  Sipes-Staff
Lecture and lab emphasizes the mechanisms of organ directed toxicities in animals. Included
are chemical carcinogenesis, teratogenesis and mutagenesis. Lecture may be taken separately
by non-majors. 2R, 4L. P, two semesters of gen. bio. (Identical with Tox. 602 which is home.)

653. Neuropharmacology (2) II 1988-89, Alternate Year  Laird-Yamamura
Role of various neurochemicals in the autonomic and central nervous systems and the effect
of drugs on the nervous system, including their influence on synthesis, storage, and release of
neurochemicals. P, 501/801, or Pcol. 471b, 561 a, 596. (Identical with Pcol. 653 which is home)

800. Research (1-6) Yr.  Staff
See Electives Manual for course description.

801. The Pharmacological Basis of Therapeutics (6) II  Palmer
Action of chemical agents upon living material at all levels of organization, with emphasis on
mechanisms of action of prototype drugs. Foundation for a rational approach to human
therapeutics and toxicology. P, Psio. 601; Bioc. 501/801. (Identical with Tox. 501)

815. Subspeciality, Yr.
a. Clinical Pharmacology (3) P, Phcl. 801
See Electives Manual for course description.

891. Preceptorship, Yr.
a. Pharmacology (3-12)
See Electives Manual for course description.

900. Research (1-5) I, II  Staff
Individual or independent work, directed reading, or special problems under the supervision of
a member of the faculty with whom specific arrangements have been made. Must be taken for
graduate credit by Pharmacology and Toxicology graduate students.

910. Thesis (1-8) I, II  Staff
920. Dissertation (1-9) I, II  Staff
930. Supplementary Registration (1-6) I, II  Staff
The Department of Physiology teaches and does scholarly work on physiological mechanisms of significance to medicine. In both teaching and research, the orientation of the Department is broad, encompassing single cell, organ, and total body function.

The Department of Physiology offers graduate instruction leading to the Doctor of Philosophy degree. The requirements for this degree are those outlined in the catalog of the Graduate College. An M.S. degree is offered only in those rare instances when individuals qualified to study for the Doctor of Philosophy are forced to terminate their graduate education.

Applicants for the Ph.D. program must hold a bachelor's degree in the physical or life sciences, engineering or mathematics and SHOULD have completed one year of physics (including laboratory), mathematics through calculus (two semesters) and biochemistry. Statistics, physical chemistry and differential equations are not required but are highly desirable, as is familiarity with microcomputers and a programming language. An introductory course or readings in biology or zoology is advisable for physical science majors. The Graduate Record Examination and three letters of recommendation are required to assist in evaluation of applicants.

Research training is an integral part of the Ph.D. program. Current research areas of faculty in the Department of Physiology include: cellular and transport mechanisms; circulation and respiration, including microcirculation; comparative physiology; endocrinology; gastrointestinal physiology; mathematical physiology; muscle physiology; neural mechanisms, including motor control; renal mechanisms; and reproductive and developmental mechanisms.
The specialized nature of the material and equipment required for courses given in the College of Medicine may necessitate some limitation of enrollment. Medical students will receive preference in courses required for the M.D. degree. All other students must obtain permission of the instructor before enrolling. Graduate students already enrolled in College of Medicine departments will be given preference.

For further information, consult the catalog of the Graduate College.

Course Descriptions

418. Physiology for Engineers (4) GC I
   Designed to bring to engineering students awareness of the structure and function of whole organisms, their component organs and organ systems. Open to nonmajors only. (Identical with A.M.E. 418, Ch.E. 418, and E.C.E. 418.)

419. Physiology Laboratory (2) GC I
   Lab experiments in physiology intended to provide experience with organ systems and measurement techniques. Designed for engineering students enrolled in the clinical engineering and biomedical engineering options. 6L. Open to nonmajors only. P, 418 or CR. (Identical with A.M.E. 419, Ch.E. 419 and E.E.E. 419.)

480. Human Physiology (4) GC II
   Principles of physiology, with emphasis on the human; designed primarily for students in pharmacy and health related sciences. Open to pharmacy majors; others consult department before enrolling. P, Chem. 243b, Math. 123, Phys. 102b, CR 481. (Identical with Tox. 480)

481. Physiology Laboratory (1) GC II
   Experiments intended to reinforce principles of physiological phenomena; designed primarily for students in pharmacy and health related sciences. Open to pharmacy majors; others consult department before enrolling. P, Chem. 243b, Math. 123, Phys. 102b, Cr 480 (Identical with Tox. 481)

495. Colloquium
   a. Introduction to the Neurosciences I (2) GC
      An introductory overview of mammalian neural structure and function. Neuroanatomical and neurophysiological principles are emphasized. P, permission of the instructor. (Identical with Interdept. 495a, which is home)
   b. Introduction to the Neurosciences II (2) GC
      An introductory overview of clinical conditions that affect the human nervous system. P, 495a or consent of department. (Ident. with Interdept. 495b, which is home)

499. Independent Study (1-5) I, II

503. Cellular Physiology (3) I
   Fundamental responses of living organisms to environmental changes by examining mechanisms which operate at the cell level. Topics include organelle structure and function, transmembrane homeostasis and transport phenomena, excitability, intercellular and intracellular communication, cellular motility, and nerve/muscle/synapse function. P, Chem. 103b, 104b, 241b, 243b; Math. 125a-125b; Biochem. 460

595/ Colloquium (2) [Rpt./12 units]

895. Consult department before enrolling for offering schedule.
   a. Mathematical Techniques in Physiology
      Review of mathematical techniques commonly used in physiology, with examples and applications in selected areas. Use of mathematical modeling in physiological research. P, Math. 125a-b, 160, not appropriate for math majors.
   b. Muscle Physiology
      Structure-function relationships in skeletal, cardiac and smooth muscles are examined with emphasis on mechanisms of excitation-contraction coupling, energetics, regulation of contractile strength, organization and composition of contractile proteins (gene expression and developmental aspects), and integrative behavior of muscle in the organisms. P, Psio. 503 or equivalent.
   c. Endocrinology
      General survey of endocrine regulation at the level of the hypothalamus and pituitary using the female reproductive system as an example. This overview provides an appreciation of the role of the endocrine system in regulating physiological homeostasis.
   d. Renal Physiology
      Detailed analysis of the mechanisms of glomerular filtration, tubular reabsorption, and tubular secretion, and their regulation. Treatments may be at the organ, epithelial, or membrane level and will involve comparative analyses among and between species where appropriate. P, Psio. 601/801, 602, or equivalent.
e. Molecular and Cellular Excitability  
   Gruener  
   An in-depth examination of ion channel behavior, including discussion of: the techniques used in the study of channels, mechanisms of channel gating, second messenger regulation and channel-lipid interactions. Expression of channel behavior in a variety of excitable cell types will be examined.

f. Peripheral Vascular Physiology  
   Gore  
   Detailed study of peripheral vascular structure-function relationships and the mechanisms that underlie the phenomena of blood flow and blood pressure regulation, transvascular exchange, blood vessel mechanics and reactivity, and the rheological properties of blood and blood-microvessel interactions. Treatments may be at the whole animal, the organ, the cellular and subcellular levels. P, PSIO 601/801 or equivalent.

g. Membranes and Transport  
   Wright  
   Indepth coverage of topics pertaining to the physiology of membrane transport including: kinetics, energetics, regulation and molecular mechanisms of specific processes.

h. Systems Neurophysiology  
   Hasan  
   Properties of neuronal networks in relation to the control of movement, detection of stimuli, and reflex responses.

i. Introduction to Personal Computers in Physiology  
   Secomb  
   Introduction to the use of personal computers in Physiology. Operating system, commonly used software packages, programming in BASIC will be discussed.

601. Systems Physiology (8) II  
   Staff  
   Comprehensive coverage of systemic physiology with emphasis on the underlying principles of function. Course provides overview of systems level neuroscience and in conjunction with PSIO 602 and 801 overviews of cardiovascular, renal, respiratory, gastrointestinal, and endocrine physiology, concludes with an integrative section. P, Chem. 103b, 104b, 241b, 243b; Phys. 102b. May enroll for credit in 601 or 602, but not both. Consult department before enrolling.

602. Systems Physiology for Neuroscience Students (7) II  
   Staff  
   Comprehensive coverage of systemic physiology with emphasis on the underlying principles of function. Includes overviews of cardiovascular, renal, respiratory, gastrointestinal, and endocrine physiology and concludes with an integrative section. Offered in conjunction with PSIO 801 and 601. P, Chem. 103b, 104b, 241b, 243b, Phys. 102b. May enroll for credit in 601 or 602, but not both. Consult department before enrolling.

605. Neurosciences (6) II  
   Angevine-Barber-Hasan  
   (Identical with Anatomy 605/805 which is home)

610. Research Methods in Physiology (1-3) [Rpt./10 units] I, II  
   Staff  
   Lab courses providing students with an understanding of the types of research available in the department. Consult with department before enrolling.

696. Seminar (1-4) I, II  
   Staff  
   a. Physiology Seminar Series (1) [Rpt./3] I, II  
      Open to majors only. Exposure of state-of-the-art topics in physiology through regular attendance at departmental seminars.
   b. Physiology Seminar: Preparation and Presentation (1) [Rpt./1] I, II  
      Open to majors only. Provides experience in preparation and delivery of a scientific seminar. Consent of instructor.
   c. Physiology Open Forum (1) [Rpt./3] I, II  
      Open to majors only. Students and faculty participate in discussion of current topics in physiology. Students gain experience in preparing and presenting critiques of current literature. Consent of instructor.

697. Workshop  
   Staff  
   a. Physiology Tutorial (3) [Rpt./4] I, II  
      A detailed examination of the literature pertaining to dissertation research. In general tutorials are taken with the major advisor. P, 503, 601 or 602. Consult department before enrolling.

699. Independent Study (1-5) I, II  
   Staff  

801. Human Physiology (8) II  
   Staff  
   Principles of physiology with emphasis on that of the human. P, Chem. 104b, 241b, 243b; Phys. 102b. Consult department before enrolling.

805. Neurosciences (6) II  
   Angevine-Barber-Hasan  
   (Identical with Anatomy 605/805 which is home)

891. Preceptorship, Yr.  
   Staff  
   a. Physiology (3-13)

899. Independent Study (1-6) I, II  
   Staff  

900. Research (1-6) I, II  
   Staff  
   Individual research not related to a thesis or dissertation for advanced degree.
920. Dissertation (1-9) I, II
Research for the doctoral dissertation.

930. Supplementary Registration (1-6)
Professors: Alan I. Levenson, Head, Allan Beigel [on leave of absence; Psychology; Vice President, University Relations & Development], Larry E. Beutler [Psychology; Chief, Clinical Psychology], Richard R. Bootzin [Psychology], Henry W. Brosin, Alfred W. Kasznak [Professor, Psychology], Mary P. Koss, John C. Racy, Alayne Yates [Chief, Child Psychiatry; Associate Professor, Pediatrics]

Associate Professors: Diane S. Fordney [Obstetrics & Gynecology], David L. Nelson [Pharmacology & Toxicology], Henry I. Yamamura [Professor, Pharmacology, Biochemistry, Arizona Research Laboratories]

Clinical Associate Professors: John J. Misiaszek, Jose M. Santiago [Adjunct Professor, Psychology], Catherine M. Shisslak [Adjunct Assistant Professor, Psychology]

Adjunct Associate Professors: Herman P. Gladstone, Ronald G. Nathan

Assistant Professors: Peter J. Attarian [Associate Professor, Family & Community Medicine], Shirley Nickols Fahey [Associate Dean, Admissions; Director, Division of Social Perspectives in Medicine; Co-Coordinator, Human Behavior & Development], Milton Frank [Chief Social Worker, Psychiatry]

Clinical Assistant Professors: James Allender [Research Associate, Surgery], Sidney W. Arkowitz, Murray M. DeArmond [Family & Community Medicine; Director, Student Health Service; Lecturer, Psychology], Martha P. Fankhauser [Pharmacy Practice], Richard M. Hinton, Russell D. Martin, Jon H. McCaine, Rebecca L. Potter, David L. Stoker, D. Kinne Tevis, Robert A. Vanputten

Adjunct Assistant Professors: Michael R. Berren, Hayward M. Fox [Associate, Psychology], Kenneth F. Marsh [Head, Mental Health, Student Health Service; Associate, Psychology], Bernard M. Morenz III, Joan B. Rosenblatt, Herschel D. Rosenzweig

Visiting Assistant Professor: Varda Shoham-Salomon


Senior Clinical Lecturers: JoAnn B. Fineman, Stephen C. Scheiber, Michael R. Zales

Clinical Lecturers: John T. Andersen, Thomas E. Bittker, Elvid A. Faz-Guevara, Robert W. Garrett [Family & Community Medicine; Adjunct Clinical Assistant Professor, Pharmacy Practice], John S. Lawall, Raymond K. Lederman, Glenn Lippman, Timothy A. Musty, Robert G. Rhode [Family & Community Medicine; Visiting Assistant Professor, Psychology], Margaret S. St. John [Family & Community Medicine], Robert L. Winsky

Assistant Clinical Lecturers: Hector J. Fernandez-Barillas, Peter J. Lusche, William E. Merry, Rudolph Oldeschulte, Frederic E. Schindler [Adjunct Instructor, Family & Consumer Resources], Laura S. Schnaps

Research Associates: G. Maureen Chaisson, David Eugene Engle, Mary V. Fox [Pharmacology, Psychology], Elizabeth B. Yost [Associate Professor, Counseling & Guidance]

Visiting Assistant Professor, Educational Psychology], Patricia S. Nye, Theodore J. Radomski, Leland K. Reeck, David A. Ruben, Martin E. Sodomsky, Hubert E. Wuesthoff
Education Specialist: Elizabeth M. Segerstrom

The program of the Department of Psychiatry is designed to help students develop an understanding of the variety, range, and determinants of both normal and abnormal forms of human behavior. In addition, the student is helped to develop those skills that are needed in recognizing and dealing with mental disorder, whether primary or secondary to other illness.

To meet these goals, both didactic courses and clinical instruction are offered in the College of Medicine curriculum. After students have been introduced to normal personality functions and to abnormal processes which form the basis of psychopathology, they are given an opportunity to work directly with patients in a variety of clinical settings, both psychiatric and medical.

In addition to clinical training, the students are helped to develop an understanding of the current social, economic, and legal issues relevant to the organization and delivery of mental health services.

Course Descriptions

495. Colloquium
   b. Introduction to the Neurosciences II (2) GC
      Staff
      An introductory overview of clinical conditions that affect the human nervous system. P, 495a or permission of the instructor. (Identical with Interdept. 495b, which is home)

599. Independent Study (1-6) I, II
      See Electives Manual for course description.

800. Research (1-12) I, II
      See Electives Manual for course description.

803. Clinical Clerkship (6-9) Yr.
      Staff
      Students are assigned patients in inpatient clinical settings. They obtain and record a complete history, mental status, and physical examination. The students are expected to study the course of their patients and record their observations in daily progress notes. They work closely with clinical staff in the diagnosis, specific treatment, ward management, and discharge planning involving their patients. In addition, they are introduced to community and legal services for the chronically ill, the suicidal, and the violent patient. Those students wishing to take an additional three- or six-week clerkship in psychiatry may elect to do so. (See 810 description.)

810. Clerkship, Yr.
   a. Clinical and Community Psychiatry (6) Yr.
   b. Child Psychiatry (6) Yr.
      See Electives Manual for course description.

815. Subspecialty, Yr.
   a. Consultation Psychiatry (6)

891. Preceptorship I, II
   a. Psychiatry (6) [Rpt./2] I, II

899. Independent Study (1-18) I, II
      Staff
Professors: James R. Cassady, Head [Radiation Oncology], Silvio Aristizabal [Assistant Professor, Obstetrics & Gynecology], Thomas C. Cetas [Aerospace & Mechanical Engineering], Eugene W. Gerner [Radiation Oncology], Roger C. Jones [Electrical & Computer Engineering], Hugo V. Villar-Valdez [Surgery]
Associate Professors: George T. Bowden [Pharmacology & Toxicology], Robert B. Roemer [Professor, Aerospace & Mechanical Engineering; Adjunct Professor, Electrical & Computer Engineering], Jeffrey M. Trent [Director, Basic Science Research, Cancer Center; Research Associate Professor, Internal Medicine]
Assistant Professors: Anne E. Cress, Kullervo H. Hynynen [Aerospace & Mechanical Engineering], Bruce A. Lulu, Wendell R. Lutz [Aerospace & Mechanical Engineering], David S. Shimm [Internal Medicine], Baldassarre D. Stea, Jeffrey F. Williamson [Director, Medical Physics, Staff Physicist]
Radiation Oncology is that discipline of medicine concerned with the application of radiation in the treatment of patients, the majority of whom have benign and malignant neoplasms. The discipline is also concerned with the interactions and modifiers of radiation in tissues, as well as subcellular, cellular and organ effects of such treatment. The department consists of four divisions including the Division of Cancer Biology, Division of Physics, Division of Biostatistics and Clinical Division. The department is also active in research and clinical application of hyperthermia for patients with malignant disease.

Course Descriptions

501. Radiation Biology (3) II  
Gerner  
Basic principles of radiation effects in mammalian cell and tissue systems with emphasis on biochemical aspects, such as DNA damage and DNA repair, and cellular responses, such as cell kinetics defects and radiation repair and recovery; radiation and chemical (especially radiomimetic drugs) carcinogenesis. P, intro. bio. and chem.

551. Environmental Carcinogenesis (3) II 1988-1989  
Bowden  
See RADI 851 for description. (Identical with Micr. 551)

555. Cancer Biology (3) II  
Bowden  
(Identical with M. Micr. 555, which is home)

596. Seminar (See 896)  
Bowden  
See Electives Manual for course description.

815. Subspecialty, Yr.  
Staff  
a. Introduction to Radiation Oncology (6) Yr.  
See Electives Manual for course description.

851. Environmental Carcinogenesis (3) II 1988-89  
Staff  
Phenomenological and mechanistic aspects of cancer etiology as induced by physical and chemical agents in our environment, with special emphasis on possible molecular and cellular mechanisms involved in cancer etiology. P, consult department before enrolling.

896. Seminar  
Gerner  
h. Control of Proliferation in Animal Cells (12) II  
P, consent of department. (Identical with M. Micr. 596h/896h)  
See Electives Manual for course description.

899. Independent Study (1-12) I, II  
Staff  
See Electives Manual for course description.
Professors: M. Paul Capp, Head, Harrison H. Barrett [Optical Sciences], Theodore Bowen [Physics], Bruce J. Hillman, Theron W. Ovitt [Chief, Diagnostic Radiology], Dennis D. Patton [Optical Sciences; Chief, Nuclear Medicine], Michael J. Pitt [Surgery], Arthur J. Present [Emeritus], Joachim F. Seeger, William L. Wolfe, Jr. [Optical Sciences], James M. Woolfenden
Clinical Professor: George R. Barnes, Jr.
Associate Professors: John C. Bjelland, William J. Dallas, Robert E. Henry, Tim B. Hunter, Gerald D. Pond, Bryan R. Westerman [Director, Radiation Safety]
Clinical Associate Professor: James R. Standen
Research Associate Professor: Hans Roehrig
Adjunct Associate Professors: Theodore Ditchek, Norman N. Komar
Assistant Professors: Raymond F. Carmody, Arthur F. Gmitro, Walter H. Williams, Peter J. Yang
Clinical Assistant Professors: Harris J. Finberg, Bertram Sosnow, Cary J. Stegman, Richard D. Wächter
Research Assistant Professors: H. Bradford Barber [Optical Sciences], George W. Seeley [Research Associate, Optical Sciences], Warren E. Smith
Instructors: Jason M. Stemmer, Richard Boyle
Clinical Instructors: Richard R. Boyle, Jr., Rebecca K. Hunt, Mark I. Yoshino
Lecturers: Harry R. Claypool [Associate, Anatomy], Jack N. Hall, Joseph Vilani
Senior Clinical Lecturer: Melvin M. Figley
Clinical Lecturers: Glenn C. Cook, Donald L. Jeck, Aubrey M. Palestrant
Assistant Clinical Lecturers: Andre J. Bruwer, Anthony Lomonaco, Jim H. Stewart, Susan Wishnok
Research Associate: Robert E. Hastings, Jr. [Clinical Assistant Professor, Surgery]
Research Specialist: Kevin M. McNeill
Associates: Schuyler V. Hilts, Robert J. Johnson, T. Bryson Struse, III

The Department of Radiology includes the University Medical Center Divisions of Diagnostic Radiology and Nuclear Medicine.

Course Descriptions

800. Research (1-6) [Rpt./1] Yr.     See Electives Manual for course description.  Staff
815. Subspecialty, Yr.                      Staff
    a. Diagnostic Radiology (6) Yr., P, Path 801
    b. Nuclear Medicine (6) Yr.
       See Electives Manual for course descriptions.
891. Preceptorship, Yr.         Staff
    a. Radiology (6) [Rpt./1] Yr.
       P, Radi. 815a. See Electives Manual for course description
899. Independent Study (1-12) I, II  Staff
Professors: Leonard F. Peltier, Acting Head, Victor M. Bernhard [Chief, Vascular Surgery], L. Philip Carter, Milos Chvapil [Chief, Surgical Biology], Jack G. Copeland [Associate Director, University Heart Center; Chief, Cardiovascular & Thoracic Surgery], George W. Drach [Medical Director, University Physicians, Inc.], Eric P. Gall [Internal Medicine, Family & Community Medicine], Theodore J. Glattke [Speech & Hearing Sciences], William R. Hodgson [Speech & Hearing Sciences], Douglas Lindsey, Noel D. Matkin [Speech & Hearing Sciences], Harvey W. Meislin, [Chief, Emergency Medicine], Michael J. Pitt [Radiology], Charles W. Putnam [Associate Head; Pharmacology], Donald P. Speer [Anatomy], Robert F. Spetzler, Charles M. Tipton [Head, Exercise & Sport Sciences; Director, Health Related Professions], Hugo V. Villar-Valdez [Radiation Oncology], Robert G. Volz [Chief, Orthopedic Surgery], Charles L. Witte, Marlys H. Witte, Charles F. Zukoski III, [Chief, General Surgery]

Clinical Professors: Merrill W. Brown, Stanley W. Coulthard [Acting Chief, Otorhinolaryngology], Robert B. Gilsdorf, Donald M. Gleason, Stanley I. Glickman, Harry W. Hale, Jr., Alfred Heilbrunn [Associate Dean, Veteran Affairs], James M. Malone, George H. Mertz, Eric G. Ramsay, Richard A. Walsh, Peter J. Whitney, MacDonald Wood

Research Professor: A. Norman Guthkelch

Adjunct Professor: Henry A. Perlmutter

Associate Professors: Glenn C. Hunter, Kenneth V. Iserson, Edward C. Percy [Physical Education], Arthur B. Sanders [Family & Community Medicine; Clinical Lecturer, Internal Medicine], Thomas H. Stanisic, John B. Sullivan, Jr. [Adjunct Assistant Professor, Pharmacology & Toxicology]


Research Associate Professors: Donald W. DeYoung [Chief, Experimental Surgery, Veterinary Surgeon, University Animal Care; Adjunct Associate Professor, Veterinary Sciences], Cleamond Eskelson, Ronald L. Misiorski

Adjunct Associate Professor: Jacob B. Redekop

Visiting Associate Professor: John C. Sutherland

Assistant Professors: James B. Benjamin, Michael K. Brawer, Janis M. Burt [Physiology], Gary L. Dunnington, J. David Gibeault, Robert P. Iacono, Timothy B. Icenogle, Stanley P. Leong [Research Associate, Cancer Center], Jerry D. Mohr, Daniel W. Spaite, Terence D. Valenzuela [Clinical Assistant Professor, Internal Medicine], David B. Van Wyck [Internal Medicine], M. Andre Vasu

Clinical Assistant Professors: Richard Carmona, Sally A. Coates, Warren D. Eddy, Lloyd S. Epstein, John Habra, Timothy R. Harrington, Robert E. Hastings, Jr. [Research Associate, Radiology], Peter N. Herrington, Kenneth C. Jackimczyk, Kenneth R. Johnson, Keith R. Kaback, Herbert J. Louis, Kenneth E. McIntyre [Director, Trauma Services], Myron L. Mills, William N. Neubauer, Gregory W. Priam, William D. Rappaport, Neopito L. Robles, Jerry B. Rogers, Donna L. Seger [Clinical Lecturer, Family & Community Medicine; Adjunct Clinical Assistant Professor, Pharmacy Practice], H. Thomas Setnhey, Andrew G. Shetter, William L. White

Research Assistant Professors: David W. Montgomery [Research Associate, Pharmacology], Judith E. Riley, Judith B. Ulreich

Adjunct Assistant Professor: Vincent P. Russo

Instructor: John M. Donovan

Clinical Instructor: William J. Quinlan

Lecturers: Anthony C. Guzauskas, Joseph M. Leal, Thomas C. Rotkis, Walter P. Work

Senior Clinical Lecturer: Clovis J. Snider
Clinical Lecturers: William J. Casey, Jr., John D. Doerr [Radiation Oncology], Everett W. Gibson, Bertha W. Leis [Family & Community Medicine], Frederick J. Menick, Stanley J. Suffecool
Research Lecturers: Floyd E. Anderson, Stephen Harkins, Ann Kerwin [Visiting Assistant Professor, Classics], Ruth L. Smothers
Assistant Clinical Lecturers: Robert B. Bailey, Robert Fineberg, Alfredo Guevara, Jr., John A. Guisto, John T. Pellerito, Jr., Ronald C. Quintia, Allen R. Raczkowski
Research Associates: James Allender [Clinical Assistant Professor, Psychiatry], Pushpa P. Deshmukh, Kullervo H. Hynynen, [Assistant Professor, Radiation Oncology], Thili Kulatilake [Physiology], Hideaki Saigenji, Arlene W. Scadron, Wang Ti-Fen [Cancer Center]
Research Specialist: Russell W. Lee
The Department of Surgery provides a broad general exposure to surgery during a six week basic clinical clerkship and a three week specialty clerkship. The specialty clerkship requirement can also be met by registering for Surgery 807 in Year IV. The basic clerkship stresses preoperative evaluation, proper operating room conduct, and postoperative management. Basic operative skills are practiced in the animal laboratory. An awareness of the nature and management of surgical disease is developed by lectures and rounds and weekly conferences. The surgery Specialty Clerkship reinforces these basic skills by application to specialty areas such as urology, orthopedics, neurosurgery, cardiothoracic surgery and otorhinolaryngology.

Elective courses in general and specialty surgery and various aspects of surgical biology are offered. Increased clinical responsibility is assured on hospital services by assigning the elective student to the patient care team. Special courses designed around specific clinical activities and research programs in the Department of Surgery and other departments are available on an individual basis.

The graduate program in surgical sciences includes hospital training in general and specialty surgery with a strong emphasis upon the five-year graduate program. It emphasizes training of the clinical surgeon but encourages elective surgical study for future community, academic or research surgery.

Course Descriptions

800. Research (1-12) Yr. Staff
See Electives Manual for course description.

803. Clinical Clerkship (6-9) Yr. Dunnington-Staff
Introduction to clinical surgery through hospital clerkship on surgical wards.
807. Specialty Clerkship (3) Yr.  
Dunnington-Staff  
Introduction to clinical surgery through exposure to a surgery Specialty Clerkship (as assigned by the Surgery Department).

810. Clerkship, Yr.  
Staff  
a. General Surgery (4-8) Yr.  
See Electives Manual for course description.

811. Subinternship, Yr.  
Sanders  
a. Emergency Medicine (4-6) Yr.  
See Electives Manual for course description.

815. Subspecialty, Yr. [Rpt./3]  
Rappaport-Staff  
a. Urinary Stone Disease (6) Yr.  
b. Cardiopulmonary Surgery (4-12) Yr.  
c. Neurosurgery (3-6) Yr.  
d. Surgical and Medical Problems in Fluid and Electrolyte Balance (3) [Rpt./1] Yr.  
e. Urology (4-6) Yr.  
f. Orthopedics (3) Yr.  
g. Cardiovascular Physiology and Research (6-12) Yr.  
h. Lymphvascular System in Health and Disease (6-12) Yr.  
i. Otorhinolaryngology (3) Yr.  
j. Sports Medicine (Section of Orthopedic Surgery) (3-8) [Rpt./1] Yr.  
k. Orthopedic Bioengineering (3-6) Yr.  
l. Trauma (3-6) Yr.  
m. Spinal Cord Injury (3) Yr.  
o. Surgical Critical Care (3-6) Yr.  
p. Pediatric Orthopedic Surgery (3-6) Yr.  
q. Clinical Experience in Rehabilitation Medicine (4) Yr.  
r. Vascular Clinical Management (4-8) Yr.  
s. Emergency Medicine (4-12) Yr.  
t. Clinics in Medical Ignorance (3-4) Yr.  
See Electives Manual for course descriptions.

891. Preceptorships, [Rpt./3] Yr.  
Rappaport-Staff  
a. Surgery and Subspecialties (4-12) [Rpt./3] Yr.  

896. Seminar (1-18) [Rpt./1] Yr.  
Witte-Staff  
a. Medical Ignorance (2)  
See Electives Manual for course description. P, Completion of Sophomore Year.
DIVISIONS

DIVISION OF BIOMEDICAL COMMUNICATIONS

William T. Harrison, Ph.D., Director
Richard A. McNeely, M.A., Associate Director

The Division of Biomedical Communications is an academic support unit providing comprehensive communications media planning and production services for the Arizona Health Sciences Center. A professional staff provides medical photography, illustration, television, instructional materials design and development, computer-aided print publication services, and media utilization services in support of the teaching, in-service training, research, and public service programs of the College of Medicine.

A primary goal of the Division is to provide timely, creative, innovative and cost-effective resources for the instructional communication needs of the faculty, staff and students.

CANCER CENTER DIVISION

Sydney E. Salmon, M.D., Director

The Arizona Cancer Center was established in 1976 with an overall goal to significantly contribute to research related to the understanding and treatment of cancer. To attain its goal, the Cancer Center pursues the following objectives:

1) Serve as a major geographic resource identified as a Cancer Research Center
2) Promote excellence in clinical and laboratory cancer research, patient care and education
3) Facilitate and coordinate cancer-related programs at the University of Arizona
4) Develop an outreach program to serve the State of Arizona

The Cancer Center has been involved with planning educational, clinical and scientific activities. The Center's commitments have included educational programs for medical and graduate students as well as teaching of practitioners and allied health professionals at local and national continuing medical education programs. Medical Student Cancer Programs have been awarded to students to work in cancer-related projects with faculty throughout the College of Medicine and other health professionals throughout the state. The monthly Tumor Board at the University Medical Center is open to all interested persons and discusses aspects of cancer patient management and cancer prevention. As part of the required curricula of medical students, individual lectures in cancer education are presented in the Departments of Biochemistry, Microbiology and Immunology, and Pharmacology.

The clinical oncology and clinical research programs of the Cancer Center have continued to draw an increasing cancer patient volume to the Arizona Health Sciences Center which is now the acknowledged leading resource for provision of cancer care in the state.

Multidisciplinary cancer research expertise is continually developed and expanded in numerous clinical and laboratory programs that include basic research studies on oncogenes and on carcinogenesis; the study of heat, radiation and drugs in cancer therapy; the interaction of Vitamin A and its synthetic derivatives with pre-neoplastic and neoplastic states; the definition of the pathophysiology of clonal growth of human tumors; clinical pharmacology of anticancer drugs; tissue kinetics; tumor virology; cellular and molecular biology; medical imaging of cancer; tumor immunology, cancer prevention; cytogenetics; and carrying out clinical trials of promising approaches to cancer prevention, diagnosis and treatment.

CHILDREN'S RESEARCH CENTER

Lynn M. Taussig, M.D., Medical Director

The Children's Research Center, established in 1986, represents a multidepartmental and interdisciplinary approach to research related to various medical problems facing children. The goals of the Center include:

1) Coordinate, focus, facilitate and increase research related to children's health
2) Foster multidisciplinary research on medical problems related to children
3) Expand research training and education programs, thereby facilitating the training of future researchers
4) Enhance the rapid application of research observations to patient care

Special emphasis will be placed on molecular genetics, immunology, gastroenterology and nutrition, behavioral sciences, and developmental biology.
The Center's research programs are closely tied to the educational and clinical activities of the Department of Pediatrics which include extensive outreach programs in numerous communities throughout the state, and general and subspecialty pediatric clinics and inpatient services at University Medical Center, Tucson Medical Center and Kino Community Hospital.

DIVISION OF LIBRARY SCIENCE

Thomas D. Higdon, B.A., M.S.L.S., Director

The Arizona Health Sciences Center Library was one of the earliest units planned for the College of Medicine, opening its doors in September, 1967 when the first class began studies. Currently spanning and serving the entire Health Sciences Center, the library occupies 32,000 sq. ft. and maintains a collection of 155,000 volumes, 3,400 media programs and subscribes to 3,600 journals. It is open 24 hours every day, except Christmas and New Year's Day.

The library is a member of the nationwide medical library network founded by the National Library of Medicine and serves as the designated resource library for Arizona through the Pacific Southwest Regional Medical Library Service. Its resources are available not only to students and faculty of the University, but also to health care providers throughout Arizona.

Reference librarians are available to provide assistance in using the resources of the library effectively, consult with library users to solve complex information queries, formulate and perform computerized literature searches and locate factual information. Sessions on medical bibliography and information retrieval are offered in the College of Medicine curriculum. The Field Office provides similar services to library users outside the Tucson area and consultation services to hospital libraries.
The services of the library are many and most are computer enhanced. The catalog to the collection is online, allowing users to search for material in a variety of ways with a greater degree of specificity. Databases encompassing the journal literature are available for use by library users themselves or through the expertise of a reference librarian. A wide assortment of audiovisual titles in various formats (audiotapes, videotapes, videodiscs, slide/sound programs, slides and models) and eight study carrels, especially equipped to accommodate these formats, are also available. Electronic links with other libraries are maintained so that material not available locally can be obtained quickly for library users. Finally, the library houses the Microcomputer Learning Center, operated by the Office of Medical Education, and the Arizona Poison and Drug Information Center, administered by the College of Pharmacy.

LONG TERM CARE GERONTOLOGY CENTER

Theodore H. Koff, Ed.D., Director
Kristine M. Bursac, M.P.A., Associate Director

Established in 1980 at the University of Arizona College of Medicine, the Arizona Long Term Care Gerontology Center is devoted to development of a more effective, comprehensive and humane system for delivering health and social services to vulnerable and chronically ill elderly persons. Initially funded by the federal Administration on Aging, the center has assumed a leadership role in helping shape policies and programs related to aging in Arizona and as a result has been made a state-funded component of the University.

The four project areas addressed by the center are: 1) education and training, 2) research, 3) service demonstration projects, and 4) technical assistance. Working cooperatively with the other state universities, it has designed and established educational/training programs for professionals, paraprofessionals and family caregivers and has developed research methodologies and demonstration projects that address the major public policy issues affecting the aging population. By forging links between academic institutions and the state's aging network, the center serves as a catalyst for stimulating basic and applied research in geriatrics/gerontology as well as for expanding the network's capacity to deliver services in an efficient and cost-effective manner.

DIVISION OF MULTIDISCIPLINE LABORATORIES

Andrew Goldner, Ph.D., Director

The University of Arizona College of Medicine utilizes multidiscipline laboratories for the teaching of the laboratory aspects of the basic science courses. In contrast to the more traditional medical schools wherein each of the six basic science departments has its own teaching facility, this institution uses a central teaching facility which serves as the home base for the students enrolled in the preclinical years of the curriculum. Thus, instead of the students coming to the faculty, the faculty comes to the students in the multidiscipline laboratories. The student laboratory wing of the Basic Sciences Building also includes the lecture halls used by the medical students. In a single wing of the building, the medical students receive the majority of their preclinical education.

The Multidisciplinary Laboratories also provide educational support for all activities. This includes audiovisual services, including television production and display. Additional audiovisual resources are available for the research activities of the basic science faculty. These are coordinated through the Division of Biomedical Communications.
DIVISION OF RESPIRATORY SCIENCES
( CHEST - ALLERGY CENTER )

Benjamin Burrows, M.D., Director
Ronald J. Knudson, M.D., Associate Director
Michael D. Lebowitz, Ph.D., Associate Director, Environmental Programs
Lynn M. Taussig, M.D., Assistant Director
Martha Gail Cline, Research Specialist
Catherine J. Holberg, Research Specialist

The Division of Respiratory Sciences has members from many different academic departments of the University. It has responsibility for interdisciplinary pulmonary-allergy programs in research, training, and clinical services. It operates the St. Luke's Adult-Pediatric Chest-Allergy Clinic and University Medical Center's Respiratory Therapy Service, the Adult and Pediatric Pulmonary Function Laboratories, and the Blood Gas Laboratory. The Division is also responsible for collaborative postdoctoral training programs in Adult and Pediatric Pulmonary Medicine.

A major function of the Division is to coordinate multidisciplinary research programs in pulmonary disease. It is responsible for the Specialized Center of Research (SCOR) in Obstructive Airways Diseases established at the College of Medicine with funding from the National Institutes of Health. Many of the research programs of the Division are carried out in the Westend Laboratories, which are included in a "Chest Center" addition to the Clinical Sciences Building which opened in 1975. While the Division carries out a wide variety of research programs, its largest programs are a longitudinal study of a representative sample of the Tucson population (Tucson Epidemiological Study of Obstructive Lung Diseases) and a longitudinal study of newborns and their parents (the Tucson Children's Respiratory Study).

DIVISION OF RESTORATIVE MEDICINE

John T. Boyer, M.D., Director

The Division of Restorative Medicine, a collaborative and coordinating unit established in 1984 within the University of Arizona College of Medicine, brings research, education and service emphases to the increasingly important problems of geriatrics, rehabilitation, and chronic conditions. The Division has a special role in the development of multidisciplinary programs involving college faculty, allied health professionals, university scientists and health administrators in the public sector.

The Division operates geriatric assessment and care management clinics where difficult geriatric cases are referred, a home visitation program, an acute care unit for the elderly, and an academic geriatric nursing home through University Medical Center and Veterans Administration Medical Center. The Division is also responsible for the direction of physical medicine and rehabilitation in a program that coordinates with University Medical Center, Veterans Administration Medical Center and Carondelet Health Systems.

The Division provides comprehensive geriatric and rehabilitation education to medical students, residents, and fellows at the University. Statewide training opportunities in geriatrics and rehabilitation are available for community health professionals in the form of continuing medical education programs, mini-residencies, and a Journal Club. Medical forums on "Coping With Chronic Conditions," presented by Arizona Health Services Center faculty under the coordination of the Division and sponsorship of University Medical Center,
are conducted regularly for the public, patients and families, and interested health professionals.

DIVISION OF SOCIAL PERSPECTIVES IN MEDICINE

Shirley Nickols Fahey, Ph.D., Director

The Division of Social Perspectives in Medicine was established within the College of Medicine in recognition of the increasingly complicated cultural, social, economic, legal and ethical influences affecting the institution of medicine in American society. The efforts of this Division are aimed at expanding and exciting the thinking of medical students and faculty in the area of human values and the role of medicine in contemporary society.

The activities of the Division include symposia, seminars and workshops on such topics as: cultural and economic factors in health and disease, ethical issues in medicine, medical jurisprudence, health needs of the elderly, care for the terminally ill, holistic medicine, innovations in medical education, and other current issues. Local and national authorities are invited to participate in these programs from such fields as psychology, law, politics, sociology, anthropology, economics, theology, and philosophy in addition to medicine.

The Division also sponsors Kenneth A. Hill Visiting Scholars who spend time at the College of Medicine and share their perspectives on modern medicine with both students and faculty in a variety of academic and clinical settings.
University Animal Care is the central organization which provides services for care and use of animals used for teaching and research at the University. The unit reports to the Office of the Vice President for Research, who is the Institutional Official providing assurance of adherence to all laws and policies governing the care and use of animals.

The Animal Care Unit of the Arizona Health Sciences Center is located on the first floor of the Basic Sciences Building and houses all animals used by the Colleges of Medicine, Pharmacy and Nursing. The facility has held accreditation by the prestigious American Association for Accreditation of Laboratory Animal Care since 1969. Two veterinarians and a staff of trained laboratory animal technologists and technicians provide high quality animal care.

University Animal Care staff and faculty are available to train and assist investigators, research technicians and students on the proper methods of animal handling and use. Expertise in the use of specific animal models is provided to investigators, thus eliminating unnecessary use of animals.

Federal and local policy requires that all research, teaching and/or testing protocols involving the use of animals must be reviewed and approved by the Institutional Animal Care and Use Committee. The IACUC as well as the staff of University Animal Care - AHSC is involved in the assurance that all laboratory animals receive humane treatment. Concern for the welfare of animals, plus recognition of the need for quality biomedical research are the primary objectives of University Animal Care - AHSC.
The University Heart Center (1986) is a new interdisciplinary organization intended to further research into cardiovascular biology and disease. The Center’s major objectives include conduct of basic and clinical research, provision of medical and surgical care to individuals, and provision of graduate, postgraduate, and continuing educational programs, both regionally and nationally. Coordination of cardiovascular research in the state and region is a major aim; close ties with investigators are fostered. Research areas include transplant immunology, echocardiography, clinical electrophysiology, molecular biology, experimental pharmacology and cell physiology, all applicable to cardiovascular problems.

The University Heart Center operates as a Division of the College of Medicine, reporting to the Dean of the College. Its programs are linked to faculty and staff in the College, in the University Medical Center, and in other colleges and units in the University.
THE ARIZONA BOARD OF REGENTS

Ex-Officio

Rose Mofford .................................................. Governor of Arizona
C. Diane Bishop .............................................. State Superintendent of Public Instruction

Appointed

Ralph Watkins, Jr. .............................................. January, 1993
Donald Pitt, J.D. ............................................... January, 1994
Esther N. Capin, M.Ed., Treasurer .......................... July, 1988
(To Be Announced) ........................................... January, 1993
Joseph P. Mikitish ............................................ June, 1988
Donald G. Shropshire, B.S., President ....................... July, 1988
Edith S. Auslander, Ph.D., Secretary ......................... July, 1988
Herman Chanen, President-Elect ............................ July, 1989

Assistants

Molly C. Broad, M.A. ........................................ Executive Director & Chief Executive Officer
Odus Elliott, Ph.D. ........................................... Associate Director for Academic Programs
Robert Lawless, M.S. ......................................... Associate Director for Finance
Keith Pailthorp .................................................. Associate Director for Strategic Planning
Robert B. Williams ........................................... Associate Director for Capital Development & Human Resources
Lowell Thompson ............................................. Special Assistant to Executive Director
Jacqueline Schneider J.D. .................................... Counsel
Glen Brockman, J.D. .......................................... Associate Counsel
Robert Stecter .................................................. Senior Financial Analyst
Judy Garza ....................................................... Secretary to the Board of Regents
Arthur Ashton, Ph.D. ......................................... Assistant to the Executive Director
Allan Price ...................................................... Assistant Director for Public Affairs
OFFICERS OF THE UNIVERSITY

Henry Koffler, Ph.D. .................................................. President of the University

Nils Hasselmo, Ph.D. .............................................. Senior Vice President for Academic Affairs & Provost

Ben J. Tuchi, Ph.D. .................................................. Senior Vice President for Administration & Finance

Laurel L. Wilkening, Ph.D. ........................................... Vice President for Research
& Dean of the Graduate College

George R. Cunningham, M.P.A. ................................. Vice President for Administrative Services

J. Gregory Fahey, M.A. ............................................. Assistant Vice President for Administrative Services

Dudley B. Woodard, Jr., Ph.D. ................................. Vice President for Student Affairs

Don A. Aripoli, Ph.D. ............................................... Assistant Vice President for Student Affairs

Manuel Escamilla, Ph.D. ......................................... Assistant Vice President for Student Affairs

Allan Beigel, M.D. ................................................ Vice President of University Relations & Development

Jack R. Cole, Ph.D. ................................................ Acting Vice Provost for Academic Affairs

Celestino Fernandez, Ph.D. ....................................... Associate Vice President for Academic Affairs

William R. Noyes, Ph.D ........................................ Associate Vice President for Academic Affairs

Bill J. Varney, B.S. ............................................... Associate Vice President for Administrative Services

Sarah A. Blake, B.S., C.P.A. ..................................... Associate Vice President for Finance

(To Be Announced) ................................................ Associate Vice President, Center for Computing & Information Technology

Charles H. Peyton, A.B.F.T. ................................. Associate Vice President for Research

Michael A. Cusanovich, Ph.D. ............................ Acting Assistant Vice President for Research

James T. Wheeler, M.B.A. ........................................ Assistant Vice President for Research

Doris J. Ford, Ph.D. ............................................... Assistant Vice President for Academic Affairs
RECIPIENTS OF FACULTY TEACHING AWARDS

April 20, 1987

BASIC SCIENCES

Basic Sciences Educator of the Year: Lewis Glasser, M.D.

Dean's List for Excellence in Teaching in the Basic Sciences: Thomas F. Burks, II, Ph.D.
Anna R. Graham, M.D.
Mary Jane Hicks, M.D.
C. George Ray, M.D.

Outstanding Achievement in Teaching in the Basic Sciences: Department of Pathology

Outstanding Teaching by a Teaching Assistant: Diane B. Pelletier

CLINICAL SCIENCES

Clinical Sciences Educator of the Year: John C. Racy, M.D.

House Officer Educator of the Year: James E. Maciulla, M.D.

Dean's List for Excellence in Teaching by a House Officer: Kelley W. George, M.D.
Dawn P. Lemcke, M.D.
Jeffrey A. McKenna, M.D.

Dean's List for Excellence in Teaching in the Clinical Sciences: Gary L. Dunnington, M.D.
William D. Rappaport, M.D.
Jay W. Smith, M.D.

Outstanding Achievement in Teaching by a Clerkship or Elective in the Clinical Sciences: Department of Pediatrics

FOUNDERS DAY LECTURESHIPS

November 16, 1979 Henry I. Yamamura, Ph.D.
November 17, 1980 David J. Sahn, M.D.
November 17, 1981 Mark R. Haussler, Ph.D.
November 17, 1982 Diane H. Russell, Ph.D.
November 17, 1983 Robert G. Volz, M.D.
November 16, 1984 Benjamin Burrows, M.D.
November 15, 1985 M. Paul Capp, M.D.
November 17, 1986 Paul C. Johnson, M.D.
November 17, 1987 Rubin Bressler, M.D.
COLLEGE OF MEDICINE FACULTY

ADMINISTRATION

(Year of first appointment to faculty in parentheses after each name)

FULGINITI, VINCENT A. (1969) Acting Dean; Professor, Pediatrics
A.B., 1953, M.D., 1957, M.S., 1961, Temple University

HEINS, MARILYN J. (1979) Vice Dean; Professor, Pediatrics
A.B., 1951, Radcliffe College; M.D., 1955, College of Physicians and Surgeons, Columbia University

BURKS, THOMAS F., II (1977) Associate Dean, Research; Professor and Head, Pharmacology
B.S., 1962, M.S., 1964, University of Texas, Austin; Ph.D., 1967, University of Iowa

FAHEY, SHIRLEY NICKOLS (1970) Associate Dean, Admissions; Director, Division of Social Perspectives in Medicine; Co-Coordinator, Human Behavior & Development; Assistant Professor, Psychiatry
B.A., 1957, Vanderbilt University; M.A., 1963, Ph.D., 1964, University of Florida

GOLDNER, ANDREW M. (1975) Associate Dean, Student Affairs; Director, Multidiscipline Laboratories, Alumni Affairs; Associate Professor, Physiology
B.A., 1956, Oberlin College; M.A., 1957, Stanford University; Ph.D., 1966, George Washington University

HEILBRUNN, ALFRED (1977) Associate Dean, Veteran Affairs; Clinical Professor, Surgery
B.S., 1952, University of Missouri; M.D., 1954, University of Kansas
RUBECK, ROBERT F. (1978) Assistant Dean, Medical Education

SEILS, GEORGE W. (1974) Assistant Dean, Medical Administration
Ph.B., 1948, M.B.A., 1950, University of Chicago

BOYER, JOHN T. (1968) Director, Division of Restorative Medicine; Professor, Internal Medicine, Family & Community Medicine
B.S., 1951, Denison University; M.D., 1955, Harvard University

BURROWS, BENJAMIN (1968) Director, Division of Respiratory Sciences; Professor, Internal Medicine; Chief, Pulmonary Diseases Section
M.D., 1949, Johns Hopkins University

HARRISON, WILLIAM T. (1972) Director, Division of Biomedical Communications
B.A., 1965, M.A., 1966, Michigan State University; Ph.D., 1974, Ohio State University

HIGDON, THOMAS D. (1975) Director, Arizona Health Sciences Center Library
B.A., 1957, University of Oklahoma; M.S.L.S., 1958, Columbia University

KOFF, THEODORE H. (1981) Director, Long Term Care Gerontology Center
B.S., 1950, City College of New York; M.S., 1953, Columbia University; Ed.D., 1971, University of Arizona

MORKIN, EUGENE (1974) Director, University Heart Center; Professor, Internal Medicine, Pharmacology
B.A., 1955, Oklahoma City University; M.D., 1959, University of Oklahoma

SALMON, SYDNEY E. (1972) Director, Cancer Center Division; Professor, Internal Medicine; Lecturer, Pediatrics
B.A., 1958, University of Arizona; M.D., 1962, Washington University

WILSON, SUSAN E. (1973) Associate Director, University Laboratory Animal Medicine; Research Lecturer, Internal Medicine; Research Specialist, Veterinary Pathology; Adjunct Research Specialist, Veterinary Sciences
ABRAHAM, MARILYN M. (1975) Associate, Internal Medicine, College of Nursing
B.S., 1954, University of Cincinnati; M.S., 1962, Case Western Reserve University

ABRAMS, HERBERT K. (1968) Professor, Family & Community Medicine
B.S., 1936, Northwestern University; M.S., M.D., 1940, University of Illinois; M.P.H., 1947, Johns Hopkins University

ACKERMAN, ALAN (1983) Research Lecturer, Family & Community Medicine
B.A., 1970, Clark University, Massachusetts; Ph.D., 1974, Massachusetts Institute of Technology

ADAMS, GEORGE H. (1984) Research Assistant Professor, Family & Community Medicine
B.S., 1953, U.S. Naval Academy, Annapolis; M.D., 1963, Ph.D., 1966, University of Pennsylvania

AGUILAR, E. LUIS (1976) Associate, Internal Medicine
B.S., 1968, M.D, 1973, University of Arizona

AHL, NORMAN C. (1980) Clinical Assistant Professor, Ophthalmology
B.S., 1965, University of Arizona; M.D., 1969, University of California, Los Angeles

AHMANN, FREDERICK R. (1980) Assistant Professor, Internal Medicine
B.A., 1970, Duke University; M.D., 1974, University of Missouri

AICKIN, MIKEL (1987) Research Assistant Professor, Family & Community Medicine; Research Specialist, Cancer Center
B.Sc., 1966, Ph.D., 1976, University of Washington

ALBERTS, DAVID S. (1975) Professor, Internal Medicine, Pharmacology
B.S., 1962, Trinity College; M.D., 1966, University of Virginia

ALEPA, F. PAUL (1979) Professor, Internal Medicine
B.S., 1954, Lebanon Valley College; M.D., 1958, Georgetown University

ALFARO, ARMANDO J., JR. (1983) Associate, Surgery
B.S., 1972, Arizona State University; M.D., 1976, University of Arizona

ALLEN, HUGH D. (1973) Professor, Assistant Head, Pediatrics; Assistant Director, Echo-Phone Lab
B.A., B.S., 1962, Otterbein College; M.D., 1966, University of Cincinnati; Sc.D., 1985, Otterbein College

ALLEN, RENE E. (1986) Clinical Lecturer, Obstetrics & Gynecology
B.A., 1971, Arizona State University; M.D., 1975, University of Arizona

ALLENDER, JAMES (1985) Clinical Assistant Professor, Psychiatry; Research Associate, Surgery
B.A., 1975, Stanford University; M.A., 1982, Ph.D., 1984, University of New Mexico; Ph.D., 1984, University of New Mexico

ALLINSON, RICHARD W. (1986) Clinical Assistant Professor, Ophthalmology
B.S., 1973, University of Arizona; M.D., 1980, University of Texas

ALMACRO, BERTHA R. (1978) Associate Director for Processing Services, Arizona Health Sciences Center Library
B.A., 1955, M.S., 1956, University of Havana; M.S.L.S., 1958, Cuban Library College

ALMGREN, RONALD C. (1970) Associate, Pediatrics
B.A., 1951, M.D., 1955, University of Louisville

ALTSCHULER, GERALD (1974) Associate, Internal Medicine
B.S., 1950, Wagner College; M.D., 1954, Albany Medical College of Union University

ALY, HEKMAT EL-SAYED (1983) Clinical Lecturer, Family & Community Medicine
M.D., 1952, University of Cairo, Egypt; M.P.H., 1960, Alexandria University High Institute of Public Health; M.S., 1966, Columbia University; Ph.D., 1969, Cornell University

AMINIAN, HOUSHANG (1983) Lecturer, Psychiatry
M.D., 1968, Tehran University, Iran

AMPEL, NEIL M. (1985) Assistant Professor, Internal Medicine
B.S., 1975, Oregon State University; M.D., 1977, University of Oregon
B.S., 1957, M.D., 1961, Hamline University
ANDERSON, A. DUANE (1982) Research Associate, Pathology, Pharmacology
B.S., 1963, University of Wyoming; Ph.D., 1970, University of Colorado
ANDERSON, CAROLINE F. (1985) Lecturer, Obstetrics & Gynecology
R.D.M.S., 1977
ANDERSON, FLOYD E. (1980) Research Professor, Surgery
B.S., 1939, University of Wisconsin; M.S., 1946, Ph.D., 1949, University of Michigan
ANDERSON, LLOYD S. (1971) Clinical Associate Professor, Surgery
B.A., 1955, University of Michigan; M.D., 1959, Wayne State University
ANDERSON, PETER G. (1988) Visiting Research Scientist, University Heart Center
ANGEVINE, JAY B., JR. (1967) Professor, Anatomy; Lecturer, Neurology
B.A., 1949, Williams College; M.A., 1952, Ph.D., 1956, Cornell University
ANGIULO, JAMES P. (1984) Assistant Clinical Lecturer, Anesthesiology
B.S., 1968, St. John's University, New York; M.D., 1972, New York Medical College; J.D., 1985, University of Arizona
ANKENBRANDT, LEO J. (1986) Clinical Lecturer, Family & Community Medicine
B.S., 1954, M.D., 1956, University of Illinois
APOSTHIAN, H. VASKEN (1975) Professor, Pharmacology, Molecular & Cellular Biology
B.S., 1948, Brown University; M.S., 1950, Ph.D., 1953, University of Rochester
APPLEFELD, JACK J. (1987) Clinical Assistant Professor, Internal Medicine
B.A., 1968, Washington and Lee University; M.D., 1972, University of Maryland
APPLETON, CHRISTOPHER P. (1988) Assistant Professor, Internal Medicine
B.A., 1975, Stanford University; M.S., 1979, University of Washington
ARISTIZABAL, SIVLIO A. (1973) Professor, Radiation Oncology; Assistant Professor, Obstetrics & Gynecology
A.B., 1955, Colegio San Jose, Colombia; M.D., 1962, Universidad de Antioguia, Colombia
ARKOWITZ, H. S. (1977) Associate Professor, Psychiatry; Associate Professor, Psychology
ARKOWITZ, SYDNEY W. (1977) Lecturer, Psychiatry
ARNOLD, ARTHUR L. (1984) Lecturer, Psychiatry
B.A., 1948, University of California, Berkeley; M.D., 1952, University of California, San Francisco
ATTARIAN, PETER J. (1974) Associate Professor and Associate Head, Family & Community Medicine; Assistant Professor, Psychiatry
AUERBACH, BRYAN N. (1982) Associate, Pediatrics
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157
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University of Utah, M.D. 1985
ANGEL, ARMANDO C.
University of Arizona, M.D. 1977
ARNDT, PETER M.
University of Minnesota, M.D. 1988
ARROYO, ARMANDO
University of California, Los Angeles, M.D. 1986
ASHWORTH, SUSAN L.
University of Louisville, M.D. 1983
ATLAS, MATTHEW
University of Arizona, M.D. 1986
AU, KIN-SING
Johns Hopkins University, M.D. 1981
AWTREY, STATON L.
University of Texas, M.D. 1988
AZARI, DANIEL M.
Hahnemann University, M.D. 1988
BARTHOLOMEW, WILLIAM
Hahnemann Medical College, M.D. 1981
BASNIGHT, MICHAEL A.
Tulane University, M.D. 1985
BASSFORD, TAMSEN L.
University of Southern California, M.D. 1983
BEAHM, ELISABETH K.
Chicago Medical School, M.D. 1987
BECKWORTH, DENNIS D.
University of Arkansas, M.D. 1971
BENNER, KAREN A.
University of Rochester, M.D. 1988
BENSON, DAVID R.
University of Kansas, M.D. 1987
BERGEN, RONNIE
New York Medical College, M.D. 1988
BERKE, SARAH A.
University of Nevada, M.D. 1986
BERNSTEIN, JEFFREY N.
Rutgers Medical School, M.D. 1988
BEZERRA, JORGE A.
Federal University/Rio Grande, M.D. 1984

Pediatrics
Pediatrics
Family & Community Medicine
Surgery
Surgery
Anesthesiology
Psychiatry
Internal Medicine
Rheumatology
Pediatrics
Obstetrics/Gynecology
Dermatology
Anesthesiology
Radiation Oncology
Surgery
Internal Medicine
Faculty Development
Cardiology
Family & Community Medicine
Diagnostic Radiology
Hematology/Oncology
Family Practice
Ophthalmology
Neurology
Diagnostic Radiology
Emergency Medicine
Pediatrics
BIER, DENNIS E.
Brown University, M.D. 1984
Radiation Oncology

BIREN, HELEN M.
University of California, Irvine, M.D. 1987
Obstetrics/Gynecology

BIRKHOLZ, KARLA L.
University of Minnesota, M.D. 1978
Faculty Development

BLATTSTEIN, DEBORAH
Baylor Medical College, M.D. 1984
Obstetrics/Gynecology

BLESCH, LAURI S.
University of Texas, San Antonio, M.D. 1987
Pediatrics

BOCCINI, THOMAS P.
St. Louis University, M.D. 1986
Nuclear Medicine

BOREN, WILLIAM L.
University of Arizona, M.D. 1980
Diagnostic Radiology

BOYER-HASSEN, LESLIE
Harvard Medical School, M.D. 1985
Pediatrics

BRACHT, MICHAEL W.
University of Arizona, M.D. 1985
Anesthesiology

BRADBURY, GEORGE R., III
Johns Hopkins University, M.D. 1988
Orthopedic Surgery

BRAINARD, BRADLEY J.
University of Minnesota, M.D. 1984
Orthopedic Surgery

BRAKEMA, RIEMKE M.
University of Minnesota, M.D. 1987
Emergency Medicine

BRENNER, MICHAEL B.
University of California, Los Angeles, M.D. 1987
Ophthalmology

BRESLOW, MICHAEL F.
Jefferson Medical College, M.D. 1982
Psychiatry

BROWN, LAURA B.
University of New Mexico, M.D. 1986
Family Practice

BROWN, MARK A.
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Pediatrics-Pulmonary

BULL, DAVID A.
University of California, San Francisco, M.D. 1985
Surgery

BURGESS, JEFFREY L.
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Emergency Medicine

BURNS, DANIEL P.
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Internal Medicine

CAMAZINE, BRIAN M.
University of Arizona, M.D. 1986
Surgery

CERVIN, JAMES R.
University of Texas, Galveston, M.D. 1988
Pathology

CANEZ, MELIN S.
University of Arizona, M.D. 1986
Obstetrics/Gynecology

CAR DON, STEPHAN B.
University of Arizona, M.D. 1986
Anesthesiology

CARTER, PATRICIA G.
University of Arizona, M.D. 1986
Internal Medicine

CASE, TODD C.
University of Arizona, M.D. 1987
Surgery

CLARK, RANDIL L.
University of California, Irvine, M.D. 1985
Urology

CLINGER, NEAL J.
University of Washington, M.D. 1984
Diagnostic Radiology

CLOUGH, ALLISON J.
University of Colorado, M.D. 1987
Family Practice

COLTER, MARY L.
University of Utah, M.D. 1988
Internal Medicine
COMSTOCK, JODY A.  
Michigan State University, M.D. 1984  

CONNOLLY, M. BRIGID  
University of Arizona, M.D. 1984  

COPPENS, ALON  
SUNY, Buffalo, M.D., 1986  

COURTRIGHT, ISABELLE E.  
University of Arizona, M.D. 1988  

CRANSTON, ROBERT E.  
University of Illinois, M.D. 1982  

CUROSH, NANCY A.  
University of Arizona, M.D. 1986  

D'ANGELO, SALLY M.  
University of Colorado, M.D. 1987  

DALBY, SUSAN L.  
University of Arizona, M.D. 1986  

DALLER, JOHN  
SUNY, Brooklyn, M.D. 1987  

DECK, CARLOS C.  
Pontificia Universidad, Chile, M.D. 1983  

DEGROOT, IRENE R.  
University of Illinois, M.D. 1985  

DELANEY, PATRICK A.  
St. Louis University, M.D. 1987  

DEPASQUALE, JOHN M.  
Temple University, M.D. 1987  

DILLMAN, ANNETTE M.  
McGill University, M.D. 1988  

DITMANSON, LEONARD E.  
Mayo Medical School, M.D. 1986  

DOHM, MICHAEL P.  
University of Arizona, M.D. 1987  

DOMINGUEZ, LUIS M.  
Stanford University, M.D. 1981  

DORAN, GERI A.  
University of Nebraska, M.D. 1986  

DORDAL, MARGARET S.  
University of Chicago, M.D. 1983  

DUMBAULD, JAMES L.  
UHS College of Osteo Med., D.O. 1982  

DUNCAN, BRIEN M.  
Creighton University, M.D. 1985  

DUNSEATH, RODNEY A.  
Kirksville College of Osteopathic Medicine, D.O. 1982  

ELAM, ERIK A.  
Loyola University, M.D. 1986  

EPPS, THOMAS E., JR.  
Medical University of South Carolina, M.D. 1986  

FAJARDO, LAURIE L.  
University of Chicago, M.D. 1984  

FARKAS, GLEN C.  
University of Southern California, M.D. 1983  

FEDERIUK, CAROL S.  
University of California, Irvine, M.D. 1986  

FENNERTY, M. BRIAN  
Creighton University, M.D. 1980  

FIELDER, MARTHA A.  
University of Arizona, M.D. 1986  

Dermatology  
Psychiatry  
Diagnostic Radiology  
Pathology  
Neurology  
Internal Medicine  
Pediatrics  
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Surgery  
Internal Medicine  
Psychiatry  
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Pediatrics  
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Internal Medicine  
Orthopedic Surgery  
Anesthesiology  
Radiation Oncology  
Hematology/Oncology  
Family Practice  
Emergency Medicine  
Nuclear Medicine  
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Ophthalmology  
Emergency Medicine  
Gastroenterology  
Anesthesiology
FILLMORE, DAVID J.
Yale University, M.D. 1984
Diagnostic Radiology

FITZ, STEPHANIE C.
Indiana University, M.D., 1988
Pathology

FLAVILL, PAUL
University of New Mexico, M.D. 1987
Internal Medicine

FONKEN, STEVEN J.
Ohio State University, M.D. 1986
Cardiology

FORRER, SCOTT C.
Michigan State University, M.D. 1986
Neurology

FOUTY, BRIAN W.
University of Washington, M.D. 1988
Internal Medicine

FREED, JAMES F.
University of California, Irvine, M.D. 1974
Dermatology

FRIEDMAN, DEBORAH L.
Washington University, M.D. 1987
Diagnostic Radiology

FRIEDMAN, MARC. R.
New York University, M.D. 1980
Anesthesiology

GATHOF, KARL A.
University of Toronto, M.D. 1971
Psychiatry

GELMAN, LOIS M.
University of Arizona, M.D. 1984
Anesthesiology

GENOVA, RONALD T.
SUNY, Buffalo, M.D. 1988
Emergency Medicine

GERETY, BRIGID M.
University of New Mexico, M.D. 1985
Diagnostic Radiology

GIBBS, DWAYNE L.
University of New Mexico, M.D. 1983
Surgery

GIESLER, BRADY G.
University of Texas, M.D. 1987
Orthopedic Surgery

GILBERT, GENE M.
University of Rochester, M.D. 1967
Child Psychiatry

GILMAN, FRANK D.
University of Wisconsin, M.D. 1985
Internal Medicine

GOLDBERG, MARK C.
Medical College of Georgia, M.D. 1987
Internal Medicine

GONZALES, CARLOS R.
University of Arizona, M.D. 1981
Faculty Development

GONZALEZ, MARK S.
University of Texas, Houston, M.D. 1985
Cardiology

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Universidad Autonoma de Guadalajara, M.D. 1976
Hematology/Oncology

GORDON, PAUL R.
Mt. Sinai School of Medicine, M.D. 1983
Faculty Development

GREEN, JAMES J.
University of Florida, M.D. 1984
Preventive Medicine

GROSEN, ELIZABETH A.
University of Washington, M.D. 1984
Obstetrics/Gynecology

GROSS, STEVEN E.
Medical College of Virginia, M.D. 1988
Family Practice

GROSSMAN, STEPHEN M.
Chicago Medical School, M.D. 1986
Internal Medicine

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Medical University of South Carolina, M.D. 1981
Pediatrics-Pulmonary

HALL, SHANNA D.
University of Colorado, M.D. 1984
Pediatrics

HALLDORSSON, ARNI O.
University of Iceland, M.D., 1982
Surgery
HANCOCK, VIRGIL I. III
University of California, San Francisco, M.D. 1984

HARALDSTED, K. ALEXANDER
Aarhus University, Denmark, M.D. 1982

HARARI, PAUL M.
University of Virginia, M.D. 1984

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Vanderbilt University, M.D. 1985

HARTSOUUGH, ANN B.
Indiana University, M.D. 1984

HARVEY, ANNA M.
University of Texas, San Antonio, M.D. 1987

HAYES, SUSAN L.
University of Michigan, M.D. 1986

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Creighton University, M.D. 1981

HEIBA, SHERIF I.
Alexandria University, Egypt, M.D. 1977

HEVOR, MICHAEL D.
Ross University, Dominica, M.D. 1984

HOWELL, JAMES P., JR.
Stanford University, M.D. 1981

HUBER, PAULA W.
University of California, Davis, M.D. 1983

HUD, JOSEPH A. JR.
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HUGHMANICK, SUSAN F.
Dartmouth Medical School, M.D. 1986

HURST, PAUL G.
University of Kentucky, M.D. 1983

HUTCHINS, TY W.
University of Arizona, M.D. 1987

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University of Arizona, M.D. 1982

IRANI, MEHRABOON S.
Cambridge University, England, M.D. 1982

JAFFE, PHILIP E.
Albert Einstein University, M.D. 1985

JERIAN, SUSAN M.
George Washington University, M.D. 1988

JOHNSON, DALLAS W.
Texas Tech University, M.D. 1987

JONES, DONALD V.
Johns Hopkins University, M.D. 1987

JONES, KENDALL M.
George Washington University, M.D. 1985

JOSHUA, SUSAN C.
University of Louisville, M.D. 1986

KAPLAN, CHARLES S.
Tufts University, M.D. 1984

KARTMAN, ADAM A.
University of Arizona, M.D. 1986

KEATING, LYNN M.
University of Arizona, M.D. 1988

KEENE, SHARON A.
University of Minnesota, M.D. 1984

KENNEDY, COLLEEN M.
University of Texas, San Antonio, M.D. 1988

Child Psychiatry
Pulmonary
Radiation Oncology
Surgery
Pathology
Psychiatry
Pediatrics
Gastroenterology
Internal Medicine
Neurology
Anesthesiology
Dermatology
Pediatrics
Obstetrics/Gynecology
Cardiology
Anesthesiology
Emergency Medicine
Pathology
Internal Medicine
Internal Medicine
Obstetrics/Gynecology
Surgery
Diagnostic Radiology
Psychiatry
Infectious Diseases
Family Practice
Emergency Medicine
Surgery
Internal Medicine
KENNY, JAMES N., JR.
University of Chicago, M.D. 1984

KERN, WILLIAM F., III
SUNY-Downstate, M.D. 1984

KERSTITCH, MYRA L.
University of Arizona, M.D. 1985

KHAN, IMRAN U. H.
Khyber Medical College, M.D. 1981

KIRKPATRICK, DONALD M.
Washington University, M.D. 1986

KNOPER, STEVEN R.
University of Washington, M.D. 1983

KNUTSON, CYNTHIA A.
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KNUTSON, JOHN W.
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KREISLE, WILLIAM H.
Baylor Medical College, M.D. 1985

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New York University, M.D. 1982

LACKEY, DIANA L.
University of Missouri, M.D. 1985

LADIN, DANIEL A.
University of Michigan, M.D. 1984

LAM, KIT S.
Stanford University, M.D. 1984

LASALA, VICTORIA E.
Michigan State University, M.D. 1986

LAVRICH, JUDITH B.
University of Cincinnati, M.D. 1986

LEARNER, ROBERTA M.
Autonomous University de Juarez, M.D. 1984

LEE, CURTIS W.
University of Hawaii, M.D. 1984

LEITH, CATHERINE P.
Kings College, M.D. 1983

LEVINE, ALENE S.
Emilio Aguinaldo, Philippines, M.D. 1984

LICK, SCOTT D.
University of Minnesota, M.D. 1987

LINDNER, PETER J.
Louisiana State University, M.D. 1988

LIPPMAN, SCOTT M.
Johns Hopkins University, M.D. 1981

LITWIN, CHRISTINE M.
Washington University, M.D. 1985

LITWIN, SHELDON E.
Washington University, M.D. 1985

LLOYD, RICHARD W.
University of Arizona, M.D. 1986

LONGORIA, TERESA
Harvard Medical School, M.D. 1986

LOPEZ, ANA MARIA
Jefferson Medical College, M.D. 1988

LUCIO, RICHARD W., II
George Washington University, M.D. 1986

LUHN, ROGER D.
University of California, San Diego, M.D., 1986

Urology
Pathology
Faculty Development
Neurology
Internal Medicine
Pulmonary
Pediatrics
Pulmonary
Hematology/Oncology
Radiation Oncology
Surgery
Hematology/Oncology
Pediatrics
Ophthalmology
Psychiatry
Nephrology
Pathology
Psychiatry
Surgery
Internal Medicine
Family & Community Medicine
Pathology
Internal Medicine
Psychiatry
Pediatrics
Internal Medicine
Diagnostic Radiology
Psychiatry
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<td>Obstetrics/Gynecology</td>
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<td>Surgery</td>
<td>Royal College of Surgeons, Dublin, M.D. 1981</td>
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<td>Pediatrics-Pulmonary</td>
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<td>Gastroenterology</td>
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<td>Psychiatry</td>
<td>Baylor Medical College, M.D. 1957</td>
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<td>Psychiatry</td>
<td>Universidad Nacional Autonoma de Mexico, M.D. 1!</td>
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<td>McBEATH, ROBERT B.</td>
<td>Urology</td>
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<td>Pediatrics</td>
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<td>Internal Medicine</td>
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<td>Internal Medicine</td>
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<td>Orthopedic Surgery</td>
<td>University of Texas, M.D. 1983</td>
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<td>Psychiatry</td>
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<td>Ophthalmology</td>
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MEEHAN, DAVID J.  
University of Missouri, M.D. 1986  
Pediatrics

MELCER, STUART I.  
Chicago Medical School, M.D. 1988  
Surgery

MICHALOWSKI, ELLEN E.  
University of Arizona, M.D. 1985  
Obstetrics/Gynecology

MILLER, JEFFREY D.  
University of California, Los Angeles M.D. 1988  
Family Practice

MILLER, JEFFREY I.  
Johns Hopkins University, M.D. 1987  
Urology

MILLER, MELISSA M.  
University of Arizona, M.D. 1988  
Pediatrics

MILLER, MICKEY W.  
University of Arizona, M.D., 1988  
Surgery

MILLER, MICKEY W.  
University of Arizona, M.D., 1988  
Thoracic Surgery

MOAZZAMI, ROYA  
Georgetown University, M.D. 1983  
Hematology/Oncology

MODIANO, MANUEL R.  
University Nacional Autonoma de Mexico, M.D. 1982  
Pathology

MOLLOY, PETER  
University of Colorado, M.D. 1983  
Anesthesiology

MONK, JOE E.  
University of Texas, M.D. 1985  
Child Psychiatry

MOORE, FRANCES L.  
University of Louisville, M.D. 1985  
Neurology

MORLEDGE, DAVID W.  
Texas Tech University, M.D. 1986  
Psychiatry

MORRIS, TRACY L.  
Oregon Health Science University, M.D. 1987  
Obstetrics/Gynecology

MOSS, KENNETH A.  
University of California, San Diego, M.D. 1987  
Neurology

MOVVA, SASHIDHAR S.  
Gandhi Medical College, India, M.D., 1983  
Emergency Medicine

MURPHY, MARK H.  
Baylor Medical College, M.D. 1985  
Family Practice

MURRAIN, VICTORIA E.  
College of Osteopathic Medicine, Pacific, D.O. 1985  
Pediatrics-Pulmonary

NEDDENRIEP, DIANE  
University of Nevada, M.D. 1983  
Surgery

NEUMAYER, LEIGH A.  
Baylor Medical College, M.D. 1985  
Anesthesiology

NICHOLS, JOE L.  
University of Kansas, M.D. 1986  
Obstetrics/Gynecology

NICHOLSON, DOUGLAS A.  
Oregon Health Science University, M.D. 1987  
Emergency Medicine

NICHOLSON, ROBIN W.  
Oregon Health Science University, M.D. 1986  
Internal Medicine

NOWLIN, SCOTT W.  
University of Texas, Houston, M.D. 1986  
Family Practice

NYE, BRET  
Eastern Virginia Medical School, M.D. 1988  
Obstetrics/Gynecology

OLSON, CYNTHIA L.  
Georgetown University, M.D. 1988  
Orthopedic Surgery

O'MEARA, CLIFTON B.  
University of Texas, Galveston, M.D. 1986  
Surgery

OKAWA, ALLISYN  
University of Utah, M.D. 1987  
Surgery
ORION, DOREEN R.
George Washington University, M.D. 1985

OSTROWSKI, CAROLE A.
Loyola University, M.D. 1985

OTT, PETER
University of Heidelberg, West Germany, M.D. 1987

PAIGE, ELLEN M.
Eastern Virginia Medical School, M.D. 1988

PALLEY, STEVEN L.
University of Arizona, M.D. 1985

PARENT, F. NOEL, III
Jefferson Medical College, M.D. 1982

PARKER, JOSE R.
University of Arizona, M.D. 1983

PARKER, ROBERT K.
University of Colorado, M.D. 1987

PATEL, ANIL S.
BJ Medical College, M.D. 1983

PATEL, SAMIR A.
University of Cincinnati, M.D. 1988

PATTISON, BRADLEY D.
University of Washington, M.D. 1982

PAYNE, MELINDA L.
University of Cincinnati, M.D. 1979

PAZ, ISAAC B.
University de Chile, M.D. 1981

PENNOCK, GREGORY D.
Washington University, M.D. 1987

PERLER-TOMBOLY, SAMUEL E.
University of Cincinnati, M.D. 1988

PERSE, TERI L.
University of Washington, M.D. 1981

PETERSON, MARK S.
Oregon Health Science University, M.D. 1984

PIEHLER, MARK D.
University of Colorado, M.D. 1986

PINDUR, ALES
University Je Purkinje, M.D. 1978

PIOTROWSKI, JOSEPH J.
Hahnemann University, M.D. 1983

PITT, ALAN M.
University of Arizona, M.D. 1988

PITTS, KEVIN S.
University of Oklahoma, M.D. 1986

POOLE, LYNN V.
University of Texas, San Antonio, M.D. 1988

QUINT, HOWARD J.
Northwestern University, M.D. 1986

RAGLOW, GREGORY J.
Ohio State University, M.D. 1986

RATL, HABIB E.
American University of Beirut, M.D. 1985

REHAN, ANN E.
University of Iowa, M.D. 1987

REHIM, MOHSEN S.
Ain Shams University, Egypt, M.D. 1979

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Bowman Gray, M.D., 1988

Psychiatry
Pediatrics
Internal Medicine
Obstetrics/Gynecology
Gastroenterology
Vascular Surgery
Faculty Development
Pathology
Psychiatry
Family Practice
Anesthesiology
Child Psychiatry
Surgery
Internal Medicine
Emergency Medicine
Psychiatry
Surgery
Anesthesiology
Pathology
Vascular Surgery
Internal Medicine
Obstetrics/Gynecology
Pathology
Urology
Family Practice
Pediatrics
Pediatrics
Psychiatry
Pediatrics
RHENMAN, BIRGER E.
Karolinska Institute, Sweden, M.D. 1979
Thoracic Surgery

RICH, GEORGE F.
University of Utah, M.D. 1985
Anesthesiology

RICHEMONT, PHILLIP C.
Howard University, M.D. 1986
Surgery

RIFKIN, JULIE I.
University of Colorado, M.D. 1983
Endocrinology

RIFKIN, ROBERT M.
University of Colorado, M.D. 1982
Hematology/Oncology

ROBERTSON, GREGORY A.
Harvard Medical School, M.D. 1985
Surgery

RODEY, GEOFFREY T.
University of Missouri, M.D. 1987
Anesthesiology

RODGERS, DAVID L.
University of Utah, M.D. 1985
Anesthesiology

ROJAS, OSCAR I.
Medical College of Wisconsin, M.D. 1986
Pediatrics

ROPER, JOHN A.
University of Washington, M.D. 1988
Surgery

ROSADO-LOPEZ, LUIS J.
Universidad de Yucatan, Mexico, M.D., 1976
Thoracic Surgery

ROSE, CATHRYN
University of Texas, Galveston, M.D. 1986
Internal Medicine

ROSS, JOSEPH J.
Case Western Reserve, M.D. 1984
Ophthalmology

ROSSUM, ALFRED C.
University of Arkansas, M.D. 1985
Internal Medicine

SACKS, ELLIOT M.
University of Southern California, M.D. 1975
Internal Medicine

SALAZAR, VICTOR H.
Universidad Federico Villareal, M.D. 1979
Diagnostic Radiology

SALVA, PAUL S.
Texas Tech University, M.D. 1988
Neurology

SAMSON, RICARDO A.
University of Michigan, M.D. 1987
Pediatrics

SAUER, DUNCAN C.
Creighton University, M.D. 1986
Pediatrics

SAWYER, ROBERT L., JR.
Kansas University, M.D. 1984
Emergency Medicine

SCHAEFFER, JEFFREY A.
University of Texas, Galveston, M.D. 1988
Gastroenterology

SCHIEID, VICKY L.
University of Texas, Houston, M.D. 1988
Emergency Medicine

SCHILBACH, CHRISTHART
Washington University, M.D. 1968
Pediatrics

SCHLAGER, DAN
George Washington University, M.D. 1986
Psychiatry

SCHULTZ, DON A.
University of Nevada, M.D. 1987
Emergency Medicine

SCHRADER, JEFFREY A.
University of Texas, Galveston, M.D. 1988
Pathology
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<tr>
<th>Name</th>
<th>Specialty</th>
<th>University and Dates</th>
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<td>SCHWARTZ, IVY L.</td>
<td>Family &amp; Community Medicine</td>
<td>Hahnemann University, M.D. 1981</td>
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<tr>
<td>SCIOLORO, CHARLES M.</td>
<td>Surgery</td>
<td>University of Kansas, M.D. 1984</td>
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<td>SCOTT, JEFFREY D.</td>
<td>Surgery</td>
<td>Oklahoma Health Science Center, M.D. 1988</td>
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<td>SCOTT, PHILIP L.</td>
<td>Psychiatry</td>
<td>Oklahoma College of Osteopathic Medicine, D.O. 1986</td>
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<td>SEAYER, LAURIE H.</td>
<td>Pediatrics</td>
<td>University of Arizona, M.D. 1987</td>
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<td>SHEN, GARY K.</td>
<td>Surgery</td>
<td>University of Rochester, M.D. 1988</td>
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<td>SHERMAN, MARK D.</td>
<td>Ophthalmology</td>
<td>Oklahoma Health Science Center, M.D. 1988</td>
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<td>SIEGEL, RONALD S.</td>
<td>Psychiatry</td>
<td>Universidad Autonoma de Guadalajara, M.D., 1977</td>
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<tr>
<td>SLAGIS, SCOTT V.</td>
<td>Orthopedic Surgery</td>
<td>University of Southern California, M.D. 1982</td>
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<td>SMITH, ROGER A.</td>
<td>Emergency Medicine</td>
<td>University of Arizona, M.D. 1987</td>
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<td>Pediatrics</td>
<td>University of Arizona, M.D. 1987</td>
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<td>SMYTH, STEPHEN H.</td>
<td>Diagnostic Radiology</td>
<td>University of Arizona, M.D. 1978</td>
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<td>SOLARI, JOHN W.</td>
<td>Orthopedic Surgery</td>
<td>University of Vermont, M.D. 1985</td>
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<td>SOUTHWICK, KAREN L.</td>
<td>Pediatrics</td>
<td>Johns Hopkins University, M.D. 1988</td>
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<td>SPARKS, STEPHEN T.</td>
<td>Occupational Medicine</td>
<td>Loma Linda University, M.D. 1984</td>
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<td>SPEARS, BRUCE T.</td>
<td>Internal Medicine</td>
<td>University of Louisville, M.D. 1987</td>
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<td>STAGNONE, DAVID</td>
<td>Family Practice</td>
<td>University of New Mexico, M.D. 1987</td>
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<td>STANCLIFF, SHARON L.</td>
<td>Pediatrics</td>
<td>University of California, Davis, M.D. 1987</td>
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<td>STATHOS, THEODORE H.</td>
<td>Pediatrics</td>
<td>University of Nebraska, M.D. 1988</td>
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<td>STEFFE, ERIKA M.</td>
<td>Infectious Diseases</td>
<td>University of California, Davis, M.D. 1984</td>
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<td>STEFFENS, JOSEPH G., III</td>
<td>Pathology</td>
<td>University of Utah, M.D. 1986</td>
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<td>STEINER, JOYCE J.</td>
<td>Psychiatry</td>
<td>University of Arizona, M.D. 1978</td>
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<td>STENSHOEL, TAMARA A.</td>
<td>Obstetrics/Gynecology</td>
<td>Oregon Health Science University, M.D. 1988</td>
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<td>STEVENSON, MARK M.</td>
<td>Pediatrics</td>
<td>Oregon Health Science University, M.D. 1986</td>
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<td>STEWART, CHARLES V.</td>
<td>Anesthesiology</td>
<td>University of Oklahoma, M.D. 1986</td>
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<td>Anesthesiology</td>
<td>University of Utah, M.D. 1987</td>
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<td>STRAUTMAN, PAUL R.</td>
<td>Diagnostic Radiology</td>
<td>University of Arizona, M.D. 1985</td>
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<td>Anesthesiology</td>
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<td>Obstetrics/Gynecology</td>
<td>University of Arizona, M.D. 1985</td>
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TABACK, STEVEN M.
Chicago Medical School, M.D. 1986
Internal Medicine

TAM, TONY Y. M.
University of Arizona, M.D. 1985
Surgery

TARANTINO, MICHAEL D.
University of Wisconsin, M.D. 1987
Pediatrics

THAI, NICOLE H. P.
University of Montpellier, France, M.D. 1982
Pulmonary

THOMASSON, KAREN L.
University of New Mexico, M.D. 1986
Psychiatry

THOMSON, STEPHEN P.
University of Arizona, M.D. 1987
Internal Medicine

THURMAN, ALAN R.
University of Cincinnati, M.D. 1986
Surgery

TINGEY, J. MARTIN
University of Washington, M.D. 1987
Anesthesiology

TORRES, FRANCISCO R.
Autonomous Universidad de Guadalajara, M.D. 1977
Neurology

TORRES, MICHAEL S.
University of New Mexico, M.D., 1988
Psychiatry

TRAEGGER, MARC S.
University of New Mexico, M.D. 1986
Family Practice

TRUCKNER, ROBERT T.
University of Michigan, M.D. 1987
Pediatrics

TRUJILLO, MICHAEL A.
University of New Mexico, M.D. 1987
Internal Medicine

TSE, DAVID J.
University of Chicago, M.D. 1987
Emergency Medicine

TUOHY, CRAIG D.
McGill University, M.D. 1987
Surgery

ULSTAD, DAVID R.
University of Iowa, M.D. 1981
Pulmonary

UNDERBERGER, DANIEL
George Washington University, M.D. 1986
Anesthesiology

VALENCIA, FRANCISCO G.
University of California, San Diego, M.D. 1984
Orthopedic Surgery

VALENTE, JOHN E.
University of California, San Francisco, M.D. 1987
Surgery

VALENTE, SUZANNE N.
University of California, San Francisco, M.D., 1987
Preventive Medicine

VANDELIST, CRAIG L.
University of Wisconsin, M.D. 1987
Anesthesiology

VAYDA, JAMES L.
University of Vermont, M.D. 1987
Emergency Medicine

VENTRES, WILLIAM B.
University of Minnesota, M.D., 1984
Faculty Development

WAKEFIELD, MARC P.
Baylor Medical College, M.D. 1984
Rheumatology

WATAHA, JOSEPH E.
University of Utah, M.D. 1987
Anesthesiology

WAXMAN, DAEL M.
University of Kansas, M.D. 1985
Faculty Development

WEISSMAN, SETH D.
University of Miami, M.D. 1987
Internal Medicine

WELCH, KEVIN L.
SUNY, Buffalo, M.D. 1981
Dermatology
WILLIAMS, RICHARD J.
University of Texas, M.D. 1964
Thoracic Surgery

WILLIAMS, S. BRUCE
University of North Carolina, M.D. 1986
Family Practice

WILSON, JOHN R.
University of Arizona, M.D. 1986
Orthopedic Surgery

WOHL, VALERIE A.
University of Washington, M.D. 1986
Family Practice

WONG, RANDOLPH W. Y.
Jefferson Medical College, M.D. 1988
Surgery

WOODSON, MARK E.
Medical College of Wisconsin, M.D. 1985
Hematology/Oncology

WOOTEN, MARC C.
University of Texas, Dallas, M.D. 1988
Surgery

YOST, DAVID A.
University of Arizona, M.D. 1987
Family Practice

ZIARNIK, WILLIAM G.
Columbia University, M.D. 1987
Internal Medicine
### RESIDENCY APPOINTMENTS

**CLASS OF 1988**

<table>
<thead>
<tr>
<th>Candidate Name</th>
<th>Institution &amp; City</th>
<th>Specialty</th>
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<tr>
<td>AHEARN, DENISE ANNE</td>
<td>University of Arizona Affiliated Hospitals, Tucson, AZ</td>
<td>Pediatrics</td>
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<tr>
<td>AIELLO, AMY LOUISE</td>
<td>Good Samaritan Medical Center, Phoenix, AZ 85006</td>
<td>Internal Medicine</td>
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<tr>
<td></td>
<td>1989-USC Medical Center, Los Angeles, CA 90033</td>
<td>Ophthalmology</td>
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<td>BANCHY, SUSAN MARIE</td>
<td>Good Samaritan Medical Center, Phoenix, AZ 85006</td>
<td>Transitional</td>
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<td>1989-University of Virginia, Charlottesville, VA 22908</td>
<td>Anesthesiology</td>
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<td>BROWN, CHRISTOPHER M.J.</td>
<td>University of New Mexico, Albuquerque, NM 87131</td>
<td>Emergency Medicine</td>
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<td>BUETTNER, KARIN WILHELMINE</td>
<td>Medical College of Virginia Hospital, Richmond, VA 23228</td>
<td>Obstetrics/Gynecology</td>
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<td>BUTLER, THOMAS EDWARD, JR.</td>
<td>University of Kansas, Kansas City, KS 66103</td>
<td>Orthopedic Surgery</td>
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<td>CARNER, THEODORE CLYDE</td>
<td>Tucson Hospitals Medical Education Program, Tucson, AZ 85733</td>
<td>Transitional</td>
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<tr>
<td>CARROLL, JOHN A.</td>
<td>Emory University, Atlanta, GA 30322</td>
<td>Anesthesiology</td>
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<td>CHAMPSI, JAMILA HYDER</td>
<td>Children's Hospital, San Francisco, CA 94118</td>
<td>Internal Medicine</td>
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<td>CHARNETSKY, PAUL SCOTT</td>
<td>Baylor College, Houston, TX 77030</td>
<td>Internal Medicine/Pediatrics</td>
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<td>COURTRIGHT, ISABELLEMMI</td>
<td>University of Arizona Affiliated Hospitals, Tucson, AZ 85724</td>
<td>Pathology</td>
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<td>DIEDE, JAMES HERBERT</td>
<td>Maricopa Medical Center, Phoenix, AZ 85008</td>
<td>Transitional</td>
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<td>1989-Texas Tech University Affiliated Hospitals, Lubbock, TX 79430</td>
<td>Anesthesiology</td>
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<td>DIGIOVANNI, DAVID ANDREW</td>
<td>Good Samaritan Medical Center, Phoenix, AZ 85006</td>
<td>Internal Medicine</td>
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<td>1989-University of Arizona Affiliated Hospitals, Tucson, AZ 85724</td>
<td>Anesthesiology</td>
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<td>DONOHUE, STEPHEN WILLIAM</td>
<td>St. Joseph's Hospital &amp; Medical Center, Phoenix, AZ 85013</td>
<td>Internal Medicine</td>
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<td>DORSAY, DOUGLAS ADDISON</td>
<td>No Residency in 1988</td>
<td>Pathology</td>
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<tr>
<td>DUGAN, MICHAEL CRAWFORD</td>
<td>Yale-New Haven Hospital, New Haven, CT 06504</td>
<td>Obstetrics/Gynecology</td>
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<td>EKLUND, STEPHANIE LYNNE</td>
<td>Kaiser Permanente Medical Center, San Francisco, CA 94115</td>
<td>Anesthesiology</td>
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<td>FINMAN, JOEL ROBERT</td>
<td>San Bernardino County Medical Center, San Bernardino, CA 92404</td>
<td>Family Medicine</td>
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<td>FOLEY, ANN MARIE</td>
<td>Phoenix Baptist Hospital, Phoenix, AZ 85015</td>
<td>Family Medicine</td>
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<td>FOLKESTAD, BRADLEY JOHN</td>
<td>Good Samaritan Medical Center, Phoenix, AZ 85006</td>
<td>Obstetrics/Gynecology</td>
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<td>FRIEDMAN, RICHARD GORDON</td>
<td>St. Joseph's Hospital &amp; Medical Center, Phoenix, AZ 85013</td>
<td>Anesthesiology</td>
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<td>GABRIELSON, MARY HELEN</td>
<td>St. Joseph's Hospital &amp; Medical Center, Phoenix, AZ 85013</td>
<td>Internal Medicine</td>
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<td>1989-Bexar County Hospital District, San Antonio, TX 78284</td>
<td>Internal Medicine</td>
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<td>GARCIA, ANGELA</td>
<td>Florida Hospital, Orlando, FL 32804</td>
<td>Family Medicine</td>
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GEE, VIVIAN KAYE
Phoenix Hospitals Affiliated Pediatric Program, Phoenix, AZ 85010
Pediatrics

GEREN, SUSAN ARLENE
Phoenix Hospitals Affiliated Pediatric Program, Phoenix, AZ 85010
Pediatrics

GIBSON, JAMES HEYWARD
Good Samaritan Medical Center, Phoenix, AZ 85006
Transitional

HANKS, JONATHAN PAUL
Good Samaritan Medical Center, Phoenix, AZ 85006
Internal Medicine

HEIBERG, JENNIFER ANN
Good Samaritan Medical Center, Phoenix, AZ 85006
1989-University of Arizona Affiliated Hospitals, Tucson, AZ 85724
Transitional
Diagnostic Radiology

HENDERSON, PAMELA SUE
Oregon Health Sciences University, Portland, OR 97201
Otorhinolaryngology

HOSHIWARA, STEVEN TATSUO
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Family Medicine

HYDE, RONALD HILIARY
University of California, San Diego, CA 92103
Internal Medicine

INSCORE, SUSAN JENNIFER
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Internal Medicine

JACKSON, STEPHEN JOSEPH
University of New Mexico, Albuquerque, NM 87131
Family Medicine

JACQUES, RENALDO ARTURO
Methodist Medical Center, Peoria, IL 61603
Family Medicine

JOHNSON, SHARON JEAN
Tucson Hospitals Medical Education Program, Tucson, AZ 85733
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Transitional
Neurology

KEATING, LYNN MOORE
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Emergency Medicine

KENTROS, MARY KOKINOS
No Residency in 1988

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Maricopa Medical Center, Phoenix, AZ 85008
Internal Medicine

KRATZER, DIANE MAE
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Pathology

KRISTAL, STEVEN LEE
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Internal Medicine

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Otorhinolaryngology

LEE, MICHAEL THOMAS
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Orthopedic Surgery

LEVERANT, DIRK NORMAN
Maricopa Medical Center, Phoenix, AZ 85008
Internal Medicine

MAGARELLI, PAUL CHARLES
Duke University, Durham, NC 27710
Obstetrics/Gynecology

MAY, MICHELLE RIDDLE
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Family Medicine

McGAREY, LEE BULKELEY
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McMURTRY, MICHAEL GIFFORD
Mayo Graduate School of Medicine, Rochester, MN 55905
Orthopedic Surgery

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Richland Memorial Hospital, Columbia, SC 29203
Pediatrics

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Emergency Medicine

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Surgery
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Oregon Health Sciences University, Portland, OR 97201  

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No Residency in 1988  

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Anesthesiology  

Obstetrics/Gynecology  
Obstetrics/Gynecology  

Surgery  

Family Medicine  
Family Medicine  

Transitional  
Diagnostic Radiology  

Internal Medicine  
Neurology  

Transitional  
Diagnostic Radiology  

Surgery  

Obstetrics/Gynecology  

Family Medicine  
Family Medicine  

Orthopedic Surgery  

Surgery  

Family Medicine  

Neurosurgery  

Internal Medicine  

Family Medicine  

Otorhinolaryngology  

Orthopedic Surgery  

Family Medicine  

Obstetrics/Gynecology  

Surgery  

Pediatrics
TAYLOR, HORTENSIA MARIA
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Internal Medicine

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Transitional
Diagnostic Radiology

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Harbor-UCLA Medical Center, Torrence, CA 90509
Psychiatry

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1989- University of California, Orange, CA 92668
Surgery
Neurosurgery

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Family Practice

JAHAN-TIGH, GEOFFREY
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Family Practice

LOWE, WILLIAM HENRY
University of Massachusetts Coordinated Program, Worcester, MA 01655
Family Practice
STUDENTS
CLASS OF 1989

Adsit, Elaine Ramsey, Phoenix
Allen, Michael Fielding, Mesa
Alvarado, Joseph Anthony, Tucson
Bahr, Adelaide Pirrotta, Tempe
Baker, Timothy Patrick, Phoenix
Banuelos, Rosa Maria, Somerton
Berk, Carl Warren, Tucson
Boice, Margaret Ellen, Tucson
Boyle, Judith Marie, Laramie, Wyoming
Bugola, Michael Roy, Phoenix
Burke-Scott, Linda, Phoenix
Butler, Margaret Ann, Tucson
Cardenas, Diego Gomez, Scottsdale
Celaya, Gregory J., San Manuel
Clymer, Susan Ann, Tucson
Coffin, Susan Ivie, Tucson
Crawford, Mark Kendrick, Scottsdale
Dean, George Everhart, Tucson
Delduca, Mary Lou, Tucson
Derbyshire, Douglas David, Chandler
Douglas, Cary Ann, Tempe
Drazkowski, Joseph F., Phoenix
Duffey, James Paul, Tucson
Dumas, James George, Tucson
Duran, Judy Ann F., Tucson
Ernst, Julie Henderson, Scottsdale
Ervanian, James Armen, Phoenix
Evans, Edwin Charles, Tucson
Eytan, Ofer Najie, Phoenix
Fahringer, Kathleen Anne, Tucson
Fisher, Craig Dale, Tucson
Freeman, Patrick (Scott), Tucson
Gater, Jr., David Rex, Tucson
Godfrey, Patricia Mary, Tucson
Gold, Laurene Elaine, Tucson
Gonzalez, Jr., Hermilo, Casper, Wyoming
Granberry, Michael Elliott, Phoenix
Hagan, Erin Lynn, Phoenix
Hahn, Cynthia Ann, Tucson
Hariton, Gregory Bruce, Lake Havasu City
Hedberg, Peter Schuyler, Tucson
Howland, Brenda Gail, Paradise Valley
Irion, Mark Nelson, Phoenix
Justice, Wade William, Tucson
Kallgren, Mark Andrew, Tucson
Kartchner, Wade Evan, Tucson
King, David Howe, Phoenix
Laetsch, Edith Bailey, Tucson
LaMar, Michael Gerard, Tucson
Lee, LaTanya Elexa, Tucson
Levison, Jeffrey Alexander, Phoenix
Longton, William Cooper, Tucson
Mahoney, William (Mark), Tucson
Malonso, Restituto D., Tucson
Martin, Robert Wayne, Tucson
Mattice, Kathryn Elizabeth, Phoenix
Metsch, Randall Bruce, Tucson
Mull, James Randall, Tucson
Myers, Thomas Maurice, Flagstaff
Navarrette, Patricia M., Tucson
Norton, Denise Camille, Tucson
Onate, Larry Gerard, Clifton
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Pease, David Gordon, Tempe
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Pomerene, Laura Kay, Phoenix
Posner, Mitchell Scott, Tucson
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Reardon, Karen Ann, Tucson
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Saitz, Jr., Abebon Abe, Tempe
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Sanguineti, Victoria Ana, Tucson
Schnittzer, Cary Michael, Phoenix
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Duarte, Lionel Renteria, Tucson
Earle, David Bryan, Tucson
Earle, Margaret Elizabeth, Tucson
Eckes, Darryl William, Tucson
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Lewis, Kenneth Charles, Scottsdale
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Mayberry, John (Carter), Tucson
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Molina, John Ward, Guadalupe
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Pedersen, David Andrew, Tucson
Ponkey, Susan Elaine, Scottsdale
Power, Robin Miller, Tucson
Richmann, Catherine (Paige), Tucson
Robins, Guy Winston, Phoenix
Salomon, Irene Guadalupe, Nogales
Sandock, David Scott, Tucson
Schneider, Amy Gail, Tucson
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Shapiro, Steven Aaron, Tucson
Sharma, Sanjeev Kumar, Phoenix
Sheridan, Donald Charles, Fountain Hills
Silverman, Rod Spencer, Tucson
Sink, Danielle Renee, Scottsdale
South, Marie Elizabeth, Tucson
Sterrett, Marty Jayson, Missoula, Montana
Stuntz, Michael Edward, Phoenix
Thomas, Davi Robert, Phoenix
Thompson, Steven Michael, Tucson
Thorley, Gregory David, Tucson
Thornburg, Barbara Sue, Tucson
Topete, Reyes Ramirez, El Mirage
Vincent, Roseanna Lee, Tucson
Vournas, Karen Anne, Tucson
Wharton, Keith Allen, Jr., Tucson
Widman, Ronald Joseph, Tucson
Wright, Kimberly Sue, Scottsdale
Yuen, Albert Funmum, Tempe
Zuniga, Roberto Enrique, Tucson
## Class of 1991

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson, John</td>
<td>Tucson</td>
</tr>
<tr>
<td>Arambula, Patrick</td>
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<td>Tucson</td>
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<tr>
<td>Yoe-Lee, Siang</td>
<td>Scottsdale</td>
</tr>
</tbody>
</table>
INDEX

Administration, list of, 95-96
Admissions information, 18-24
  Acceptance, contingency for final, 20
  Addresses, list of important, 24
  Alternate list, 21
  AMCAS (American Medical College
  Application Service), 18-20, 24
  Application deadline, 20
  Application fee, 19
  Application packet, 19
  Application Procedure, 18-20
  Application Request Card, 19
  Educational Commission for Foreign
  Medical Graduates (ECFMG), 24
  Extracurricular interests (of applicants),
  20
  General information, 18
  Minority Applicants, 22
  Prerequisites for, 18
  Process, 20-21
  Rural Arizonans, 22
  Transfer application, 22-23
Advisory Council, 26
Arizona Board of Regents, 92
Association of American Medical
Colleges (AAMC), 18, 24
Awards, Recipients of Faculty Teaching, 94
Biomedical Communications, Division of,
84
Calendar, academic, 2-5
Cancer Center Division, 84
Children's Research Center, 85
Class of
  1988 (see Residency Appointments),
  172-175
  1989, 176
  1990, 178
  1991, 179
Code of Scholastic Conduct, 26
Committees, College of Medicine, 152-156
Committees, Student, 157-158
College of Medicine, 8
Clinical Facilities, 10
Committees, 152-156
Educational Philosophy and
  Curriculum, 11
Faculty, 95-151
Library, 9
Physical Facilities, 8
Residency Training, 14
Course Listing, Key to, 35-37
Curriculum, College of Medicine, 12-14
Curriculum Outline, 16-17
Departmental Courses, 39-83
  Anatomy, 39-41
  Anesthesiology, 42
  Biochemistry, 43-46
  Family and Community Medicine, 47-50
  Internal Medicine, 51-54
  Microbiology and Immunology, 55-56
  Molecular and Cellular Biology, 57-59
  Neurology, 60-61
  Obstetrics and Gynecology, 62
  Ophthalmology, 63
  Pathology, 64
  Pediatrics, 65-67
  Pharmacology, 68-69
  Physiology, 70-73
  Psychiatry, 74-75
  Radiation Oncology, 76-77
  Radiology, 78-79
  Surgery, 80-83
Divisions, 84-91
  Biomedical Communications, 84
  Cancer Center, 84-85
  Children's Research Center, 85-86
  Library Science, 86-87
  Long Term Care Gerontology Center,
  87
  Multidiscipline Laboratories, 87
  Respiratory Sciences (Chest-Allergy
  Center), 88
  Restorative Medicine, 88-89
  Social Perspectives in Medicine, 89
  University Animal Care, 90
  University Heart Center, 91
Educational Commission for Foreign
Medical Graduates, (ECFMG), 24
Educational Philosophy and Curriculum,
11
Faculty, listing of, 95-151
  Administration, 95-96
  Faculty, 97-151
  Committees, 152-156
Faculty Teaching Awards, Recipients of, 94
Fifth Pathway Participants, 175
Final acceptance, contingency for, 20
Financial Information, 28-31
Awards, 30-31
Expenses, 28
Financial assistance, 28-31
Loans, 30
Scholarships, 28-29
Founders Day Lectureships, 94
Grades, consideration of academic record in, 20
Graduate Education, 14
Health Service, student, 26
History, 7-8
College of Medicine, 8
University of Arizona, 7
Housing, student, 25
Human Behavior and Development, 13, 38
Interdepartmental courses, 38
Colloquium (Introduction to the Neurosciences), 38
Human Behavior and Development, 38
Preparation for Clinical Medicine, 38
Seminars, 38
Supplementary Registration 38
Initial screening, AMCAS, application, 19-20
Interviews, personal, for admission, 19
Letter of Intent, 20
Letters of Recommendation, 18, 20
Library, Arizona Health Sciences Center, 9-10, 86-87
Library Science, Division of, 86-87
Long Term Care Gerontology Center, Division of, 87
M.D. - Ph.D. Program, 14
Map, University of Arizona Health Sciences Center, 6
Medical College Admission Test (MCAT), 18-24
Medical Education, Office of, 15
Medical School Admissions Requirements book, 18
Minority Applicants, 22
Multidiscipline Laboratories, Division of, 87
Notification of Action, Admissions Committee, 20
Notification of receipt of application, 19-20
AMCAS, 20-21
College of Medicine, 20-21
Officers of the University, 93
Orientation, student, 12-13, 25
Personal interview, applicants, 19-21
Personal statement, applicants, 20-21
Petition for exemption, basic science courses, 14
Ph.D. degree (departments offering), 14
Physical Facilities, Arizona Health Sciences Center, 8-10
Population, metropolitan area, 7
Postgraduate education, 15
Practicing physicians, postgraduate education of, 15
Preparation for Clinical Medicine, 13, 38
Prerequisites for admission, 18
Quarter hours, requirements for admission, 18
Regents, (see Arizona Board of Regents), 92
Rejection, (notification of), 20
Residence, state of, 18
Residency Appointments (Class of 1988), 172-175
Residency Training, 14-15
Residents, College of Medicine, 159-171
Respiratory Sciences (Chest-Allergy Center), Division of, 88
Restorative Medicine, Division of, 88-89
Rural Arizonans, 22
Semester hours, requirements for admission, 18
Social Perspectives in Medicine, Division of, 89
Student Affairs, Office of, 25-27
Advisory Council, 26-27
Code of Scholastic Conduct, 26
Counseling and Advising, 26
Housing, 25
Orientation, 25
Student Health Service, 26
Student Representatives, 27
Student Committees, 157-158
Student Progress, 32-34
Appeals, 34
Evaluation system, 32-33
General, 32
Guidelines, 33-34
Student Research Opportunities, 14
Supplementary materials, receipt of, 19
Symbols, Key to (courses), 37
Teaching Awards, Recipients of Faculty, 94
Transcripts, 19
University Animal Care, 90
University Heart Center, 91
University Medical Center (clinical facilities), 10
University of Arizona, 7
Western Interstate Commission for Higher Education (WICHE), 18, 20, 22
Withdrawal of admission, 20