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THE
UNIVERSITY OF ARIZONA
RECORD

Announcements in this catalogue concerning regulations, fees, curricula, or other matters, are subject to change without notice.

STATEMENT OF MAILING PRIVILEGE

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THE UNIVERSITY OF ARIZONA
SUMMARY OF MINIMUM ANNUAL EXPENSE
FOR FULL-TIME CAMPUS STUDENTS

Effective September 1, 1968

	<i>General</i>	<i>College of Law</i>	<i>College of Pharmacy</i>
Residence Halls, Minimum rate (1)	\$ 260.00	\$ 260.00	\$ 260.00
Meals in University Cafeteria, Meal tickets	500.00	500.00	500.00
Books and Supplies (\$40 per semester) (2)	80.00	100.00	80.00
Registration Fee (\$144.50 per semester) (3)	289.00	289.00	289.00
Laboratory and Incidental Fees	25.00	— 0 —	— 0 —
Special College Fee	— 0 —	70.00	60.00
Total Minimum Annual Expense (Legal Residents of Arizona)	\$1,154.00	\$1,219.00	\$1,189.00
Nonresident Tuition Fee (\$407.50 per semester) (4)	815.00	815.00	815.00
Total Minimum Annual Expense	\$1,969.00	\$2,034.00	\$2,004.00

All students should add to this list incidental personal expenses as needed, and room reservation deposit of \$25. Men students taking military science should add a military deposit of \$25.

All fees are payable to the University Cashier on registration day as the final step in the registration procedure. Do not send checks in advance. Residence hall rent should be paid by the semester at the beginning of the semester. Students may purchase meals at the University cafeteria on a daily a la carte basis, or may purchase meal ticket books for bi-weekly or monthly periods.

(1) The residence hall rates range from \$130 to \$180 per student per semester.

(2) Freshman students should provide for an additional \$50 for the first semester.

(3) \$144.50 for credit load of 7 or more units; includes services and facilities of student activities, Student Union, Infirmary, Artist Series, Library, and Alumni Association; does not include course, laboratory and nonresident fees.

Students taking 6 or less units of work pay \$16.00 per unit.

(4) \$34 per unit for 7 through 11 units of work. Nonresident fee waived for students taking less than 7 units of work.

Office of Business Affairs

2/9/68

Revisions — Pages 1-370

Page

- 6-7 *ACADEMIC CALENDAR, 1968-69, second semester, change Spring Recess "April 4 F-7 M Incl." to: March 29 Sa (NOON) — April 6 Sun Incl.*
- 117 *ADMISSION OF SPECIAL STUDENTS, following paragraph two, add new paragraph:*
Special students are eligible for services of the Student Health Service on payment of a health fee and compliance with University regulations applicable to regular students. These include completion by student's private physician of admission Health Evaluation and Physical Examination form, and the chest X-ray required of all regular students.
- 121 *REQUIRED SUBJECTS — LOWER DIVISION, Freshman Composition, add to end of fourth paragraph:*
Native American students with a bilingual background may be advised to take English 5a and 5b without credit before proceeding to English 1 and those same students may also be advised to take Speech 1.
- 122 *MILITARY SCIENCE OR AEROSPACE STUDIES, after third paragraph add new paragraph:*
If a student completes 56 units before the unit requirements as listed above are met, he is thereafter not required to enroll in ROTC, provided he satisfactorily completes a unit of ROTC each semester prior to the attainment of 56 units.
- 128 *SECOND BACHELOR'S DEGREE, delete last half of last sentence beginning "except in College of Mines . . ."*
- 132 *INCOMPLETE GRADES, add to first paragraph:* The grade of 7 must be removed within one year. Students requesting an extension of time must file a petition for approval.
SPECIAL GRADES, change paragraph to read:
SPECIAL GRADES — The grades S (Superior) or P (Passing) are used in place of grades 1 or 2 for (1) Individual Studies courses as follows: 199 (Independent Study), 299 (Special Problems), 400 (Research), 405 (Internship), 410 (Thesis), 420 (Dissertation); (2) Honors 50 (Sophomore Colloquium), Honors 250 (Honors Seminar); (3) Microbiology 101a-101b (Medical Technology).
The only grades available in courses numbered 199, 299, and 400, Honors 50 and 250, and Microbiology 101a-101b are S, P, 3, 4, 5, 6, 7, 8.
For courses numbered 399, the instructor may use these special grades *or* the regular number grades as his own or departmental policy dictates; but all registrants in a given instance must be graded by the same system.
The only grades available for all other courses in the 400 series (405, 410, 420) are S, P, 5, 6, 7, 8.
- CHANGE OF GRADE, delete first two sentences and substitute:* Final grades submitted by instructors may be changed on a grade-change form if there has been an error in their computation or for an equally justifiable reason stated on the form.
- 136 *HOUSING FACILITIES, change to:* Rooms in the residence halls are completely furnished including pillows, sheets, and pillowcases. Sheets and pillowcases are laundered weekly. Three heavy blankets should be provided for sleeping porch use. Students are requested not to bring additional furniture with them, but are asked to provide their own window curtains and spread for daybed except in Arizona, Sonora, Coronado, Manzanita, Mohave, and Maricopa Halls which are furnished with curtains. Students care for their own rooms, but maid or janitor service is supplied through other portions of the hall.
- 137 *HOUSING REGULATIONS FOR UNDERGRADUATE WOMEN STUDENTS UNDER 21 YEARS OF AGE, change paragraph two to:* No change of hall residence may be made until cleared through the Department of Student Housing. No change of sorority residence may be made until cleared through the Office of the Dean of Women.
Add, after final paragraph on page: Unaffiliated students under 21 years of age who are permitted by their parents to live off campus may carry a maximum of 10 units per semester.

HOUSING REGULATIONS FOR UNDERGRADUATE WOMEN STUDENTS 21 TO 23 YEARS OF AGE, change paragraph one to: By action of the Board of Regents, an unaffiliated undergraduate woman, carrying 12 units or more, who at the time of the Catalogue-announced date of the last day of registration for credit has already had her twenty-first birthday, may live off campus. However, this is permissible only if she is on neither academic nor social probation. Unaffiliated graduating seniors who need only 11 units to complete their degrees have the option of living in a residence hall or off campus.

Change paragraph four to: If an affiliated woman is given permission by the Corporation Board of her sorority to live off campus, she must have on file in the Office of the Dean of Women a letter from an alumnae officer designated by the Corporation Board releasing her from the requirement of living in the Chapter house.

GRADUATE STUDENTS AND UNDERGRADUATE WOMEN STUDENTS 23 YEARS OF AGE OR OVER, change paragraph one to: Such students assume responsibility for their own living arrangements but, in case of vacancies, may apply to the Department of Student Housing for residence hall accommodations. If admitted, they conform to all regulations for senior students.

HOUSING FOR MARRIED STUDENTS, add new paragraph:

The University of Arizona proudly offers to qualified married students one of the finest family-housing projects in the nation. The 420 one-story apartments are conveniently located in northeast Tucson about 12 to 15 minutes drive from the main campus. Each apartment offers a breath-taking view of the beautiful Santa Catalina Mountains.

The apartments feature individually controlled refrigerated air conditioning and heating, all-electric kitchen, refrigerator-freezer, disposal, wall-to-wall carpeting, draperies, private patio, heated seventy-foot swimming pool, lighted sidewalks and paved streets, ample parking space, recreation area, and laundry facilities.

- 139 "Summary of Minimum Annual Expense for Campus Students," line four, "Registration Fee . . . \$279," change amount in each college to: \$289.
Line seven, "Total . . . \$1119 — \$1184 — \$1144," change totals to: \$1129 — \$1194 — \$1164.

Add fourth column: Nursing

To line six, under new "Nursing" column, add: \$5.

- 140 REGISTRATION FEE, line one, change "fee of \$139.50," to: \$144.50.

- 141 Add after LAW COLLEGE FEE:

NURSING COLLEGE FEE — All students registered for seven or more units of credit are required to pay a fee of \$5 a semester in addition to other fees.

PHARMACY COLLEGE FEE, line two, change "fee of \$25," to: \$30.

Line three, change "fee of \$3.50," to: \$4.50.

- 144 RESIDENCE HALL FEES, change, "Maricopa, Triple Occupancy" listing to: Double Occupancy, \$160

Change, "Yavapai" listing to: \$160.00.

Add new section:

FAMILY HOUSING

Unit Type	Unfurnished Monthly Rate	Furnished Monthly Rate
Efficiency	\$72.50	\$ 80.00
One-bedroom	82.50	92.50
Two-bedroom	92.50	105.00

These rates include the cost of water, gas, and electricity.

- 147 HERMAN E. DEMUND FOUNDATION, line two of description, delete "Arizona resident."
- 149 RUTH COWDEN MEMORIAL SCHOLARSHIP, delete "Memorial" in title.
- 156 CHARLES, CHARLES, JR., AND ANTHONY VOMASKA MEMORIAL SCHOLARSHIP, change "Source" to read: A gift from Mrs. Sophia Vomaska, wife and mother.

- 165 NATIONAL COUNCIL OF JEWISH WOMEN, TUCSON SECTION, under "Eligibility," following "... graduate students" add: who are residents of Arizona.
- 170 RUTH COWDEN MEMORIAL SCHOLARSHIP, delete "Memorial" from title; under "Source" delete "late" from description.
- 174 AMERICAN SMELTING AND REFINING COMPANY SCHOLARSHIPS, under "Eligibility" change beginning of sentence to: Two awards are available to junior and senior. . . .
- 181 NATIONAL COUNCIL OF JEWISH WOMEN SCHOLARSHIP, TUCSON SECTION, under "Eligibility," following "graduate students" add: who are residents of Arizona.
- 199 Before "the Walter Roche Memorial Fund" insert: THE RENAUD LOAN FUND — Established in memory of Ernest and Charlie Renaud to be available to deserving applicants under the general terms for University loans.
- 206 STUDENT HEALTH SERVICES, add to end of second paragraph: Compliance with University regulations requiring physical examination, smallpox vaccination, and chest x-ray is a prerequisite to eligibility for care at the University Health Service. Change second sentence in third paragraph to: After the third day a charge based on costs per day is made.
Add to end of third paragraph: Graduate students enrolled for fewer than 7 units, continuing dissertation students, and special students may become eligible on payment of health fee and submission of physical examination and required x-ray.
- 207 "REGULATIONS," line seven delete the two sentences beginning, "A chest x-ray may be . . ." and ending with "is on campus." and substitute: A chest x-ray may be obtained after arrival at the University during the first three weeks of the semester at nominal charge. Medical and nursing students should defer chest x-ray until arrival at the University.

COLLEGE OF ENGINEERING

- 263 Before "SCHEDULE FOR THE FIRST TWO YEARS," add new section:
Time Requirements for the Bachelor's Degree in Engineering
The bachelor of science degree in the various engineering specialties is awarded upon satisfactory completion of 140 units, as required by the University, the College, and the appropriate department.
The College of Engineering and the University considers 15–16 units per semester a satisfactory work load.
- 299 GROUP UNITS — to Group IV, add: "or Oriental Studies courses crosslisted with any of these disciplines."
- 309 Top of page, change "Biology . . . 12 units" to: Biology . . . 8 units.
- 310 PHARMACY, add to first paragraph: "or Biology 1a and 1b."

COLLEGE OF MEDICINE

- 312 Change "Inorganic chemistry . . . 12 units" to: Inorganic chemistry . . . 8 units.
Change "Zoology (Biology) . . . 12 units" to: Zoology (Biology) . . . 8 units.
Change last paragraph to:
Additional information may be secured from the Admissions Office, College of Medicine.

COLLEGE OF MINES

- 316 Delete first paragraph and substitute: A minimum of 140 total units of credit must be completed to earn a bachelor of science degree in each of those curricula of the College of Mines that do not require summer field courses; in the curricula where summer work is stipulated, the total credits required are adjusted accordingly, not to exceed 146. In any case, the program of credits must follow one of the prescribed curricula. Any deviation therefrom must be approved through proper channels of the College of Mines. A regular student who earns 17–18 units in each semester and the necessary summer units, where required, may complete the degree requirements within four years. A student who earns, on the average, only 15–16 units in each semester plus summer field work, if necessary, will require four and one-half

years to earn a degree. For this reason, any student who is earning credits at a rate which will ensure completion of degree requirements within four and one-half years and who is maintaining a satisfactory grade record will be considered by the College to be making normal progress toward a degree.

SECOND BACHELOR'S DEGREE, line three, delete all of sentence following "30 additional units."

COLLEGE OF PHARMACY

- 333** *In paragraph five, line three, change "Bot. 1" to: Biol. Sci. 3. Change Zoo. 1a to: 6a. Immediately following add: or Biol. Sci. 1a and 1b.*

Add to end of paragraph five:

Admission to the College of Pharmacy by students transferring from out of state who have entrance requirement deficiencies is not possible.

GRADUATE COLLEGE

- 359** *Special Requirements Under the Plant Science Program, paragraph one, line four, delete "entomology."*

Revisions — Courses of Instruction — Pages 371-624

INDIVIDUAL STUDIES

- 373** *Independent Study 199, change (2 to 4) to: (Credit varies)*

AEROSPACE AND MECHANICAL ENGINEERING

- 376** *Add new course:*

103. Metal Machining (2) I Foster
Principles and methods applied to the machining of metals to design, drawing, and specification for the production of finished metal parts. P, Phys. 3a or CR. Fee, \$8.

AGRICULTURAL BIOCHEMISTRY

- 383** *303a-303b. Change number to: 362a-362b. Change description to: (Identical with Biological Science 362a-362b)*

AGRONOMY

- 395** *303a-303b. Change number to: 362a-362b. Change description to: (Identical with Biological Science 362a-362b)*

Add new department: ANATOMY

Add new courses:

301. Neurosciences (3) II Angevine-Stuart
Essentials of mammalian neural structure and function. P, Chem. 2b, 43b, 45b; Physics 2b, Biol. Sci. 6b, and one of the following: Biol. Sci. 255 or 210.
302. Comparative Vertebrate Neuroanatomy (3) I Angevine and Staff
A presentation of the comparative structure of the central nervous system in selected examples of the various vertebrate classes primarily for medical students and graduate students in anatomy. P, 301, Biol. Sci. 155 and permission of instructors.
304. Human Microscopic Anatomy (4) I Staff
Essentials of microscopic human anatomy. P, Chem. 2b, 43b, 45b; Physics 2b; Biol. Sci. 6b, and one of the following: Biol. Sci. 155 or 157.
305. Special Topics in Microscopic Structure (3) II Hoist and Staff
Selected concepts of structural organization at light and electron microscopic levels of the anatomy and development of the cells, tissues, and organs of vertebrates. Different systems will be studied in consecutive years. May be repeated for credit. P, 304, 308 and Biol. Sci. 155.
308. Gross Human Anatomy (6) I Krutzsch and Staff
Comprehensive survey of the structure of the human body. P, Chem. 2b, 43b, 45b; Physics 2b; Biol. Sci. 6b, 155.
309. Selected Topics in Gross Human Anatomy (2 to 6) II Krutzsch-Staff
Study in depth of the gross human anatomy of selected areas or systems. Course may be repeated for credit. P, 304, 308, and permission of the instructors.

- 310a-310b. Anatomical Techniques (3-3) Yr. Staff
Introduction to special techniques and procedures of analytical anatomy. P, 304, 308 and permission of the instructors.
313. Experimental Cytology (3) II Staff
A special program designed to train students in the techniques of cytological investigation. P, 304; Biochem. 260, 261, 360, and permission of the instructors.

INDIVIDUAL STUDIES

299 (1 to 6); 400 (1 to 6); 401 (0)

399 ANTHROPOLOGY

140a-140b. *Change description to:*

140a: Study of the human phenotype by anthropometric methods. P, 1a or 4 units in zoology. 140b: Mechanisms of inheritance and racial classification. P, 1a or 4 units in zoology. 140a is not prerequisite to 140b.

150a-150b. *Change "Dozier" to:* Turner

203. *Change "II" to:* I

401 240. *Change units from "2" to:* (3)

246. *Change number to:* 246a-246b. *Change units to:* (3-3). *Delete:* "II 1967-68" and *add:* Yr. 1968-69.

Add new course:

274. Comparison of Theories of Personality (3) I Madison
(Identical with Psychology 274)

279. *Change description to:* (Identical with Psychology 279 and Sociology 279)

ARCHITECTURE

403 390. *Change description to:* (Identical with Geography and Area Development 390 and Urban Planning 390)

406 ART

Add new courses:

51. Pre-classical Art (3) I 1968-69 Cahn
World art from the paleolithic era to the birth of classical civilization. A study of the formal characteristics of art and architecture against the changing cultural backgrounds of the Mediterranean basin. P, 7 and 8, or 6 units of history.

52. Classical Art (3) II 1968-69 Cahn
A stylistic analysis of the emergence of classical art and architecture from the earliest period in Greece to the gradual disappearance of the classical spirit in the world of late Roman antiquity, 1000 B.C.-500 A.D. P, 7 and 8, or 6 units of history.

201. Early Medieval Art and Architecture (3) I 1968-69 Cahn
The development of Christian art and architecture from its earliest manifestations in the late Roman times to the flowering of European culture during the Carolingian Renaissance. P, 7 and 8, or 6 units of history.

202. Later Medieval Art and Architecture (3) II 1968-69 Cahn
European art and architecture from the late Carolingian period through the International Gothic style. A discussion of the sources and development of the great styles of the Middle Ages, with special attention given to Ottonian, Romanesque and Gothic art. P, 7 and 8, or 6 units of history.

Delete: 204

409 ASTRONOMY

Add new course:

71. Astronomy (3) I Staff
An accelerated review of general astronomy primarily for science majors. P, Math. 44 or equivalent. Credit is not allowed for both 1a-1b and 71.

100a-100b. *Change prerequisite to:* P, 71, Math. 79b, CR in Phys. 10.

Add new courses:

265. Medical Biochemistry (5 to 6) I Hanahan, Mathews, Wells
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. A laboratory section for medical students only is presented, stressing experimental techniques used in biochemical research. 5R, 4L. P, Chem. 2b, 41, 45b; Physics 2b, and permission of instructors.
361. Advanced Topics in Biochemistry (1) I Staff
Tutorial discussion at an advanced level of topics of biochemical importance. P, CR Chem. 260. Primarily intended for first-year graduate students in Ph.D. program in biochemistry.
368. Biological Regulatory Mechanisms (2) I Mathews, Jensen
Control mechanisms affecting formation and function of biological macromolecules. P, Chem. 260.
369. Biochemistry of Simple and Complex Lipids (2) II (1968-69) Hanahan, Wells, and Adams
A treatment of the chemical nature of the naturally occurring simple and complex lipids with particular reference to their role in membranes and in lipid-protein reactions in general. P, Chem. 260.
398. Special Topics (1 to 5) I, II Staff
Special topics, not covered in regularly scheduled courses, available to students preparing for the doctoral degree in biochemistry. Approval must be obtained from the appropriate staff member and the Biochemistry Program Chairman before registration.
399. Seminar (1 to 3) I, II Staff
Reports on current research topics in biochemistry. Required of all graduate students in the biochemistry program.

INDIVIDUAL STUDIES

299 (1 to 5); 400 (1 to 5); 401 (0)

BIOLOGICAL SCIENCES

412 Delete: "BIOLOGY" heading.

Change paragraph beginning "The major for Bachelor of Science" and paragraph beginning "Course requirements" to:

The major for the Bachelor of Science degree in Biology: 1a-1b or 3 and 6a, 120, 270, 180 or 280, 210 or 260 or 266, 221, 230-230L; Microb. 117a; and 3 to 7 additional units in Biological Sciences, Entomology or Microbiology. Chem. 2a-2b, 41a-41b, 43a-43b; Phys. 2a-2b; and 8 units of mathematics are also required.

Change paragraph beginning "The Teaching Major" to:

The teaching major in Biology in the College of Education: 1a-1b or 3 and 6a, 120, 221; Microb. 117a; 4 units from Biol. Sci. 180, 270, 272, 280, or Ent. 101; 4 units from Biol. Sci. 260, 265a-265b, 210; 4 units from 136, 230, 230L, 241. Chem. 2a-2b, 41a-41b, 43a-43b, are also required.

Change paragraph beginning "The teaching minor" to:

The teaching minor in Biology: 8 units from 1a-1b, or 3 and 6a; 120; 4 units from 60, 67, 260, 265a-265b, 266; 4 units selected upon consultation with the biology adviser preferably from the following: 180, 230-230L, 270, 272, Microb. 117a, Ent. 101, 220s.

1a-1b. Change sentence beginning "Biology 1a is not open . . ." to: 1a is not open to students with credit in 3 or 6a.

Change "212" to: 201

301a-301b. Change "Yr." to: On Demand

336. Change sentence beginning "P, Bot. 166 . . ." to: P, 136 or 230.

Delete: "Individual Studies" heading and course numbers.

Delete paragraph beginning, "A major for a B.S. degree in College of Liberal Arts," and substitute: The major for the Bachelor of Science degree in Botany: 1a-1b or 3 and 6a, 120, 136, 250, 260, 270, 272, and 4 to 7 additional units in biological sciences. Chem. 2a-2b, 41a-41b, Phys. 2a-2b, and 8 units of mathematics are also required.

Delete paragraph beginning "A major for a B.S. degree in College of Agriculture" and substitute: The major for the Bachelor of Science in Agriculture degree in Botany: 1a or 3, 120, 270, and 16 additional units in botanical or biological courses.

Change "1" to: 3. Change sentence beginning "Not open to . . ." to: Not open to students with credit in 1a.

Change "2" to: 4. Change sentence beginning "Nor for credit . . ." to: Not for credit toward a major in Biology, Botany or Zoology; elective credit if 270 follows.

Change "93" to: 60. Change sentence beginning "Credit is not . . ." to: Credit is not allowed for both 60 and 260.

Change "166" to 136. Change prerequisite in sentence beginning "P, . . ." to: P, 1b or 3.

Change "172" to 120.

Change "202" to: 250. Change prerequisite (P) to: P, 1b or 3.

Change "203" to: 260.

Change "204" to: 272. Change prerequisite (P) to: P, 1b or 3.

Change "212" to: 275.

Change "213" to 261. Change units to: (3). Change instructor to: O'Leary.

Change description to read: The distribution, function, and movement of water in plants; development of internal water deficits and their significance to physiological processes. P, 260.

Change "222" to: 276.

Change "224" to: 273. Change "I" to: On Demand.

Change "232" to: 228. Change prerequisite to: P, 120. Change "(Identical with Microb. 232)" to: (Identical with Microb. 228).

414 Change "242" to: 252. Change prerequisite to: P, 250.

Change "252" to: 270. Change "II" to: I.

Change "266" to: 237.

Add course:

314. Advanced Cytology (4) II

Bartels

The study of ultrastructural morphology and physiology of the cell, emphasizing the extra-nuclear aspects of organelle development and function. 3R, 3L. P, Chem. 143a. Fee, \$10.

Change "303a-303b" to: 362a-362b. Change instructors to: Staff. Change description to: 362a: Selected topics in plant metabolism and photosynthesis. 362b: Growth and development. 362a is not prerequisite to 362b. P, 260. (Identical with Ag. Biochem. 362a-362b, Agron. 362a-362b, and Hort. 362a-362b).

Change "313" to: 361. Change instructors to: Matsuda-Staff. Change prerequisite to: P, 260.

322. Change prerequisite to: P, 120

Change "324" to 374. Change "I 1967-68" to: On Demand.

Change "332" to: 323. Change "Harris" to: Ward. Change prerequisite to: P, 120.

Change "366" to: 332. Change prerequisite to: P, 136 or 230-230L.

Delete: 399.

Delete: "Individual Studies" heading and course numbers.

Delete paragraph beginning "The Fishery Biology Major . . ." and substitute:

The major for the Bachelor of Science degree in Fishery Biology: 6a-6b, 40, 241, 245, 282; 8 units of upper-division courses related to the major; 16 units in botanical or microbiological courses. A minimum of 16 units, in aggregate, from chemistry and physics, and 8 units of mathematics are also required. The major is offered in cooperation with the Arizona Cooperative Fishery Unit. Students are urged to spend at least one summer working for an agency engaged in fish management in a western state.

415 Delete: "WILDLIFE BIOLOGY" heading.

Change paragraph beginning "the Wildlife Biology major . . ." to:

The major for the Bachelor of Science degree in Wildlife Biology: 6a-6b, 40, 244, 246, 272; 12 additional units selected from 230, 230L, 241, 283, 284, 285, and 136 or R. M. 216; 4 additional units selected from courses in botany or watershed management. Chem. 1a-1b or 2a-2b and 8 units of mathematics are also required. The major is offered in cooperation with the Arizona Cooperative Wildlife Unit. Students are urged to spend at least one summer working for an agency engaged in wildlife management or forest conservation in a western state.

Delete: "ZOOLOGY" heading

Change "1a-1b" to: 6a-6b

1a-1b. Line one of description, change "1a" to: 6a. Line two of description, change "1b" to: 6b. Line three of description, change "1a and 1b" to: 6a and 6b. Change "1a" to: 6a.

Change "12" to: 30.

Change "40" to: 55. Change prerequisites to: P, 1b or 6a.

Change "41" to: 56. Change prerequisites to: P, 1b or 6a. Change instructor from "McCauley" to: Joy.

Change "57" to: 67. Change title to: Elementary Human Physiology. Change prerequisite to: P, 55 or 56.

Change "60" to: 40.

Change "130" to: 180. Change prerequisite to: P, 1b or 6b.

Change "145" to: 155. Change prerequisite to: P, 6b.

Change "147" to: 157. Change prerequisite to: P, 6b.

Change "174" to: 225. Add to description: P, 120.

416 Change "210" to: 205. Change title to: Quantitative Biology. In line two of description, change "zoology" to: biology.

Change "211" to: 202.

Change "216" to: 238. Change prerequisite to: P, 1b or 6b.

Change "217" to: 203.

218a-218b. Change fee to: \$10.

Change "220" to: 280. Change prerequisite to: P, 1b or 6a.

Change "229" to: 289. Change "(Identical with Microb. 229)" to: (Identical with Microb. 289)

Change "230" to: 240. Change prerequisite to: P, 1b or 6a.

Change "230L" to: 240L. Change prerequisite to: P, 240.

Change "231" to: 241. Change prerequisite to: P, 1 year of biological science and 1 year of chemistry or physics.

Change "232" to: 282. Change prerequisite to: P, 6b.

Change "233" to: 283. Change prerequisite to: P, 6b.

Change "234" to: 284. Change prerequisite to: P, 6b.

Change "235" to: 285. Change prerequisite to: P, 6b.

417 Change "238" to: 230. Change prerequisite to: P, 8 units of biological science.

Change "238L" to: 230L. Change prerequisite to: P, 230.

Change "240" to: 255.

Change "248" to: 258. Change prerequisite to: P, 1b or 6b.

Change "252" to: 210.

Change "253a-253b" to: 265a-265b. Change prerequisite to: P, 1b or 6b.

Change "254" to: 266. Change prerequisite to: P, 1b or 6b.

Change "260" to: 244. Change prerequisite to: P, 40.

Change "265" to: 246. Change prerequisite to: P, 244.

Change "268" to: 245. Change prerequisite to: P, 241, 282 and a course in statistics.

Change "269" to: 248. Change prerequisite to: P, 244 or 246.

Change "275" to: 221. Change prerequisite to: P, 1b or 3, or 6b and a course in genetics.

Change "330" to: 331. Change title to: Topics in Physiological Ecology. Change prerequisite to: P, 136 or 230-230L.

Change "334" to 384. Change prerequisite to: P, 284.

Change "335" to: 385. Change prerequisite to: P, 285.

418 Change "350" to: 366.

Change "352" to: 310. Change prerequisite to: P, 210.

Change "354" to 357. Change prerequisite to: P, 157.

Change "355" to: 367. Change prerequisite to: P, 1b or 6b.

Change "356" to: 311.

Change "358" to: 368. Change prerequisite to: P, 1b or 6b.

Change "359" to: 312.

Change "372" to: 326. Change units to: (2). Change prerequisite to: P, 120, 221.

Add:

326L. Genetics in Populations Laboratory (2) II Heed
 Laboratory and field methods in studying genetics of populations. 6L. P, 326 or
 CR. Fee, \$10.

Change "374" to: 327. Change prerequisite to: P, 120.

Change "375" to: 325. Change prerequisite to: P, 120.

Delete: 399.

Delete: "Individual Studies" heading and course numbers.

Change "222" to: 242. Add: On Demand. Change prerequisite to: P, 1b or 6b.

Change "261" to: 249. Add: On Demand. Change prerequisite to: P, 230, 240, 241, 282.

419 Change "320" to: 340. Add: On Demand.

Change "340" to: 355. Add: On Demand. Change prerequisite to: P, 155.

Change "341a-341b" to: 356a-356b. Add: On Demand. Change instructor to: Joy.

Change "353" to: 365. Add: On Demand.

Add: **BUSINESS ADMINISTRATION**

Business Administration Committee:

Professors Philip G. Hudson, Ph.D. (Economics), Chairman; Rex V. Call, Ph.D. (Marketing); Hollis A. Dixon, C.P.A., Ph.D. (Accounting); Edwin B. Flippo, Ph.D. (Management); Bernard P. Herber, Ph.D. (Economics); Michael J. Jucius, Ph.D. (Management); Walter K. Kirk, Ph.D. (Finance); John W. Leonard, Ph.D. (Economics); George W. Summers, Ph.D. (Management); Henry Tucker, Ph.D. (Systems Engineering); C. William Voris, Ph.D. (Dean, College of Business and Public Administration); Andrew W. Wilson, D.S.S. (Geography and Area Development).

The graduate program in business administration is designed to meet the demand for teachers, consultants, and management personnel trained in the application of scientific research to business problems. Both the Master of Business Administration and the Doctor of Philosophy degrees are offered.

The Doctor of Philosophy degree in business administration is an interdisciplinary degree. The program involves training both in the basic disciplines which are applicable to business problems and in the techniques of application of these disciplines. Applicants for the program may come from either of two groups: (1) those with undergraduate study, or one year of graduate work, in an area of business administration, and (2) those with undergraduate study in a basic discipline applicable to business problems or in engineering. Individual programs may vary widely in order to take full advantage of each candidate's background and special interests.

Applicants are required to take the Aptitude Test and the Advanced Test in Business of the Graduate Record Examination. This examination is administered by the Educational Testing Service of Princeton, New Jersey, several times a year in locations throughout the country, including Tucson. If an applicant has already taken the Admission test for Graduate Study in Business, this may be substituted for the Aptitude Test of the Graduate Record Examination. Participants who do not have an undergraduate background in business administration should take the Advanced Test in Business after their first year of graduate work.

During the first semester of residence, each participant must pass an oral qualifying examination. The purpose of this examination, aside from checking on

general aptitude for continuance in the program, is to facilitate the design of individual programs by revealing the student's strengths and weaknesses. The degree program includes (1) the uniform core of graduate courses required of all participants, (2) preparation in two of the fields offered within the major, and (3) a minor field which must be approved by the department in which the minor is to be taken.

Core courses must be taken in accounting, business finance, management, marketing, statistics, value and distribution, and macroeconomic theory. The fields available within the major area are accounting, finance, management, marketing, industrial and labor relations, quantitative methods in business, the behavioral sciences applied to business, and area development. The minor field will usually be selected from economics, geography, psychology, sociology, anthropology, mathematics, statistics, or systems engineering.

399. Seminar (1 to 3) I, II

INDIVIDUAL STUDIES

299 (1 to 5); 400 (2 to 4); 401 (0); 420 (1 to 9); 421 (0)

DRAMA

440 *Add new course:*

210. Creative Dramatics (3) I

Gipson

Basic techniques in creative dramatics; exploring literature and other sources for the creative project; application of creative dramatics in the school curriculum. P, 12 units in Drama or Ed. Psych. 151.

EDUCATIONAL PSYCHOLOGY

451 *Add new course:*

251. Programmed Instruction (3) I, II

Jay

Principles of programmed instruction; organization and development of learning programs; applications and uses in schools; relation to computer-assisted instruction. P, 257. Fee, \$1.50.

ELECTRICAL ENGINEERING

453 72. *Add:* Fee, \$5.

454 258. *Add:* I

455 338. *Add:* 1969-70. *To description, add:* P, 335.

ENGINEERING

459 170. *Add:* Fee, \$5.

171. *Add:* Fee, \$5.

ENGLISH

460 *Change third paragraph beginning "The major in literature and writing" to read:* 34 units, including 10a-10b; 6 units from 101, 104, 109; 6 units from 201, 204, 209, with not more than 3 units from one field; 60, 70a-70b, 227, 231a or 231b; 3 units of an upper-division elective in literature.

461 5a-5b. *Add:* Fee, \$1 for 5a.

10. *Delete, and substitute:*

10a-10b Introduction to Creative Writing (2-2) Yr.

Ramsey-Staff

A preliminary course in the problems of imaginative writing. P, 3 or 4.

****Note:** *Add:* Fee, \$1.

462 101. *Change, "P, 7 or 10" to:* P, 7 or 10a-10b.

104. *Change, "P, 7 or 10" to:* P, 7 or 10a-10b.

109. *Add:* P, 10a-10b.

201. *Change, "P, 101 or professional experience" to:* P, 101.

204. *Change, "P, 104, or professional experience" to:* P, 104.

Add new courses:

207. English Grammar for ESL (3) I

Staff

Main elements of grammar as applicable to English as a second language.

213. Applied ESL (3) II 1969-70

Staff

Guided experience in the actual teaching of English as a second language.

465 399. *Add:* k. Linguistics.

- Page
- ENTOMOLOGY
- 466 204. *Add: Fee, \$10.*
- GEOCHRONOLOGY
- 473 304. *Add to description: Field trips. Fee, \$5.*
- GEOGRAPHY AND AREA DEVELOPMENT
- 479 *Add new course:*
390. Projects in Planning (2 to 7) I, II Staff
(Identical with Architecture 390 and Urban Planning 390)
- GERMAN AND RUSSIAN
- 489 "Individual Studies," *Add: 400 (1 to 3); 401 (0)*
- HEALTH, PHYSICAL EDUCATION AND RECREATION
- 496 *Add new courses:*
49. Baseball (1) I Sancet
Instruction and practice in the fundamentals of baseball. Fee, \$5.
50. Basketball (1) I Larson
Instruction and practice in the fundamentals of basketball. Fee, \$3.50.
51. Football (1) II Tatum
Instruction and practice in the fundamentals of football. Fee, \$5.
52. *Change title and description to:* Social Dance (Identical with PEW 21-28s)
53. *Change title and description to:* Folk Dance (Identical with PEW 21-28e)
- 498 *Add new course:*
270. Sex Education (3) I Rees
Critical analysis of the current philosophy, principles, programs, problems, trends and basic issues in sex and venereal disease education on the elementary, junior high and high school levels. The status of sex and venereal disease education will be examined both in the United States and in some selected foreign countries.
- HISTORY
- 502 *Add new courses:*
236a-236b. History of Rome (3-3) Yr. Breslow
236a: The Roman Republic to the death of Caesar. 236b: The Roman Empire through the reign of Constantine the Great.
252a-252b. Nineteenth-Century Europe (3-3) Yr. Staff
Evolution of the European state system after the Congress of Vienna, together with a consideration of liberalism, socialism, and imperialism.
- HOME ECONOMICS
- 505 *Add new course:*
22a-22b. Dietetics (1-1) Yr. Kight
Survey of the applied area of nutrition. Experience in local hospitals and food-service institutions. Field trips will vary each semester.
- HORTICULTURE
- 512 225. *Add description:*
Construction, specialized equipment, and cultural practices for the management of high-quality turf areas. 2R, 3L. P, Biol. Sci. 60 or 260. Fee, \$3.
303a-303b. *Change number to:* 362a-362b. *Change description to:* (Identical with Biological Science 362a-362b)
- 513 "Major in Landscape Architecture"
119. *Change to:* 40.
128. *Change last sentence of description to:* (Identical with Arch. 128 and Hort. 128)
226. *Change to:* 50.
- JOURNALISM
- 520 54. *Delete course and substitute:*
54a-54b. Fundamentals of Broadcasting. (2-2) Yr. Cooper-Fowler
(Identical with Speech 54a-54b).
107. *Change prerequisite to:* P, 5b, 54a.

- Page*
- 521** 206a-206b. *Change prerequisite to:* P, 54b, 208a.
208. *Delete course and substitute:*
208a-208b. Radio-TV Production (3-3) Yr. Thure
(Identical with Speech 208a-208b).
- LAW**
- 523** *Add new course:*
169. Federal Courts (3) I Woods
192. *Change title to:* Creditors' Remedies. *Change units from "(3)" to:* (2)
- 524** *Add new course:*
200. International Law (3) II Reynolds
- MATHEMATICS**
- 530** 13. *Change number to:* 113. *Add to description:* Not applicable to mathematics major in Liberal Arts.
14. *Change number to:* 114. *Add to description:* Not applicable to mathematics major in Liberal Arts.
- 533** 308. *Delete course and substitute:*
308a-308b. Tensor Analysis Theory and Applications (3-3) Yr.
Linear vector spaces, tensor theory, Riemannian geometry, analytical mechanics, calculus of variations, mechanics of continuous media, and relativistic mechanics. P, 230 or 232.
**** 321. Delete course and substitute:**
**** 321a-321b. Complex Analysis (3-3) Yr.** Staff
Analyticity, Cauchy's integral formula, power series expansions, Laurent expansion, singularities, residues. Riemann mapping theorem, normal families, entire functions, analytic continuation, algebraic functions, functions of several complex variables.
**** Graduate credit will be allowed for only one of 203 or 205b. Graduate credit will be allowed for only one of 203 or 205 or 321a.**
- 534** *Add new course:*
378. Approximation Theory (3) I Staff
Interpolation, least squares, Tschebyscheff and uniform approximation computational methods. P, 321a-322a.
390. *Delete course and substitute:*
390a-390b Advanced Probability Theory (3-3) Yr. Staff
Convergence types: weak in probability, L_p , and probability one; sums of independent random variables, central limit theorems, stochastic processes: continuous martingales, decomposable and second order processes. P, 322b.
- MICROBIOLOGY AND MEDICAL TECHNOLOGY**
- 541** 229. *Change number to:* 289. *Change description to:* (Identical with Biological Science 289)
232. *Change number to:* 289. *Change description to:* (Identical with Biological Science 289)
- MILITARY SCIENCE**
- 543** 103a-103b. *Change description to read:*
Leadership; military teaching principles; branches of the army; small unit tactics and communications; pre-summer camp orientation; leadership laboratory. Academic subject. 3R, 1L.
104a-104b. *Delete:* 4R, 1L. *Add:* Academic subject. 3R, 1L.
- MINING AND GEOLOGICAL ENGINEERING**
- 547** *Add new courses:*
322a-322b. Advanced Design of Mining Systems (3-3) Yr. Staff
Integration of knowledge and techniques of various engineering and science fields, economics and business administration in the design of mining systems. 9L. P, S. E. 272. Fee, \$5.

NURSING

- 555 *Add to end of first paragraph, following “. . . achievement tests.”:*
All students registered for seven or more units of credit are required to pay a fee of \$5 a semester in addition to other fees.
- 556 *Add new course:*
49. Evaluation of Nursing Practice (2 to 4) I, II Shields
For employed registered nurses who wish to develop techniques for the assessment of nursing care rendered by themselves and others.

ORIENTAL STUDIES

- 561 *Change fourth paragraph to: The major: 7a-7b (as Oriental Studies, History or Anthropology) or 9a-9b (as Oriental Studies or History) and 24 additional units from the following lists as arranged with the major professor, to include:*
(1) China Specialization: 100a-100b, 200a-200b, and 275a-275b.
(2) Japan Specialization: 120a-120b, 220a-220b, and 280a-280b.
(3) India Specialization: 130a-130b, 230a-230b, and 285a-285b.
(4) Middle East Specialization: 160a-160b, 260a-260b, and 272a-272b.
(5) Other Asian Specialization as approved by the Chairman.

- 563 239. *Change “I” to: II.*
240a-240b. *Change title to: Governments of the Far East (3-3) I.* 240b, Japan, 1968-69.

PHYSICAL EDUCATION FOR WOMEN

- 573 31 through 38. *Add: (s) Social Dance*

PSYCHOLOGY

- 585 101. *Delete.*
216. *Change “I” to: I, II*
218. *Delete: “Field trip. Fee, \$3.”*
231. *Delete.*
- 586 308. *Change “II” to: I*
309. *Change “II” to: I*

PSYCHOLOGY

- 588 374. *Change to: 274. Add to description: (Identical with Anthropology 274)*
Add new course:

279. Culture and the Individual (3) I, II Kelly
(Identical with Anthropology 279 and Sociology 279)

ROMANCE LANGUAGES

- 593 French
75a-75b. *Add to description: 75a-75b are offered each semester. Fee, \$1 each semester.*
- 595 Italian
1a-1b. *Add to description: 1a and 1b are offered each semester.*
3a-3b. *Add to description: 3a and 3b are offered each semester.*
275a-275b. *Change units from “(2-2)” to: (3-3).*
Portuguese
102a-102b. *Add to description: 102a and 102b are offered each semester.*
275a-275b. *Change units from “(2-2)” to: (3-3). Add: Barrow*
Spanish
- 597 75a-75b. *Add: Fee, \$1 each semester.*
- 598 104a-104b. *Add: 104a and 104b are offered each semester.*
205. *Add: II*

SOCIOLOGY

- 602 *Add new course:*
89. World Population Problems (3) II Kalbach
Social, economic, and political implications of trends in population growth and redistribution, and problems of population control with reference to both industrialized and underdeveloped nations. P, 1a.

- 603** *Add new course:*
 183. Technology and Social Development (3) II Bennett
 The nature of technological change and its impact on the peoples and institutions of industrial and developing societies; the implications of this for national and world order. P, 6 units of sociology.
- 604** 279. *Change description to:* (Identical with Anthropology 279 and Psychology 279)
 289. *Change title from "Population" to:* Population Analysis.
- SPEECH**
- 609** *Delete course and substitute:*
 54a-54b. Fundamentals of Broadcasting (2-2) Yr. Cooper-Fowler
 Introduction to broadcasting. Survey of radio and television in society, broadcast history and law, functions of broadcast personnel, comparative world broadcast systems, standards of criticism for these mass media, professional aspects and forms of transmission. (Ident. with Journ. 54a-54b).
208. *Delete course and substitute:*
 208a-208b. Radio-Television Production (3-3) Yr. Thure
 Production and direction of various types of radio and television programs, including techniques of studio operation, lighting, staging, use of equipment for both black and white and color TV, and personnel relations in and out of the studio. (Ident. with Journ. 208a-208b).
- 610** *Add new course:*
 277. Problems of the Acoustically Handicapped (3) I Staff
 Basic techniques of pure-tone audiometric testing; interpretation of hearing handicap with respect to habilitation or rehabilitation; problems encountered with amplification units. Not open to majors in Speech Science.
- SYSTEMS ENGINEERING**
- 614** 172. *Line four of description, change, "E. 170" to:* E. 171.
- URBAN PLANNING**
- 619** 390. *Change last line of description to:* with Arch. 390 and Urb. Pl. 390)