

207, 208. Comparative Grammar of Greek and Latin.

207. 4 units (Devine) by arrangement 208. 4 units (Devine) by arrangement

## **COMMUNICATION**

Emeritus: Chilton R. Bush (Professor) Executive Head: Clifford F. Weigle

Director, Institute for Communication Re-

search: Wilbur Schramm

Professors: Herbert Brucker, Nathan Maccoby, Wilbur Schramm, Clifford F. Weigle Associate Professors: Edwin B. Parker, William L. Rivers. Acting: George C. Stoney Assistant Professors: David G. Clark. Acting: Godwin C. Chu, William J. Paisley Instructors: Henry S. Breitrose, Janet K. Voelker

Lecturers: William B. Blankenburg, Daniel E. Garvey, Jr., Lyle M. Nelson, Templeton Peck

The Department of Communication engages in research in communication and offers a curriculum which prepares its students for careers in journalism, broadcasting, documentary film, and communication research.

The main objectives of the professional curriculum are to provide a broad program in the social and humanistic studies; to present courses in the processes and effects of communication, and to equip the student with an adequate set of professional values.

A secondary objective is to provide that amount of training in skills and techniques that will sustain the student's interest in his chosen profession and will assist him in beginning his career.

The technical courses provide not only practice but a content that is an application of some of the principles of the behavioral sciences and humanities. The technical curriculum in this sense is like the curricula of the Schools of Medicine and Engineering which apply the principles of the biological and physical sciences.

#### Admission

Undergraduate students who have been admitted by the University are accepted as majors provisionally for one quarter. Thereafter, the student's record is reviewed quarterly by the Department.

Students who wish an undergraduate minor in the Department may arrange for a suitable sequence of preprofessional courses.

Prospective undergraduate students should write the Office of Admissions.

Prospective graduate students should write to: Executive Head, Department of Communication, Stanford University, Stanford. California 94305.

The Department requires that applications for graduate admission include verbal and quantitative scores from the Graduate Record Examination (area scores are optional). Applicants who hope to work toward a Ph.D. are also required to submit scores from the Miller Analogies Test. These test requirements may be waived after written petition to the Department only if exceptional circumstances prevent the applicant from taking the tests.

#### PROGRAMS OF STUDY

#### BACHELOR OF ARTS

Two Bachelor of Arts degree programs are offered, one in the Journalism Division and one in the Broadcasting and Film Division. Requirements are as follows:

- 1. Two courses in general or English literature; Psychology 1; Sociology 1 or Anthropology 1. In addition, Journalism Division students are required to take Economics 1 and Political Science 1 and 10 or 20. (The student who wishes to take both Political Science 10 and 20 may substitute 15a and b.)
- 2. A unified program totaling not less than 20 units of courses numbered 100 or higher shall be arranged, with the approval of the adviser, from one or two other departments such as Anthropology, Art, Economics, English, History, Music, Philosophy, Political Science, Psychology, Sociology, or Speech and Drama.
- 3a. Broadcasting and Film Division: Communication 1, 100a and b, 105a, or b or c; 123; 141 or 142, and 180.
- 3b. Journalism Division: Twenty-five to thirty units in communication of which the following courses are required: 1, 50, 51, 107, 108 and 140. In addition, the student preparing for newspaper or press association editorial work will take Communication

169 and 175; the student preparing for advertising work will take Communication 115 and 116; the student interested primarily in writing for consumer magazines and industrial publication will take Communication 150 and 169.

While the Department offers no courses in such subjects as science reporting, technical writing, or public relations, appropriate programs of study can be arranged for interested students. For example, a prospective science writer could be permitted to substitute a unified program of courses in the physical sciences in lieu of requirement "2" above.

Majors in Communication may elect one of the following interdisciplinary honors programs:

Behavioral Sciences (Honors Programs in Quantitative Methods)

Humanities Undergraduate Honors Program

Social Sciences (Honors Program in Social Thought and Institutions)

#### COMMUNICATION HONORS PROGRAM

In addition to the regular undergraduate programs in communication, a Communication Honors Program is designed for those exceptionally able students who wish, in their major, to pursue an intensive and somewhat independent study of communication. This program is directed toward the integration of a substantial body of theoretical and factual information and the development of both communication skills and creative scholarly skills by independent study, tutorial guidance, small seminars, and research experience. Particular emphasis is placed on the planning of an individual program for the student that will combine his specialized interests with a body of basic knowledge about communication processes. The plan will be aimed at helping the student prepare for a comprehensive examination to be taken in the final quarter of his senior year, over his entire area of communication study. The plan will include arrangements for continuous supervised work in communication skills or in communication research. A report of the work done under this plan will be submitted as an undergraduate thesis at the end of the next to final quarter of the student's senior year. It is possible for a student to elect both the Communication Honors Program and one of the three interdisciplinary honors programs listed above.

#### MASTER OF ARTS

The Master of Arts degree is awarded by the Department in the fields of Journalism, Broadcasting and Film, or Communication Research. Requirements are as follows:

- 1. The candidate must earn 45 units in graduate residence at Stanford; he must earn an average grade of B on his entire program of study. An independent project under the direction of a major professor must be undertaken. Three to six hours of credit in independent study may be applied to this requirement. A report of the project must be made to the professor directing the independent study. A candidate may petition the Department by the end of the second week of the second quarter for permission to submit the report as a thesis.
- 2. A unified program of advanced course work is to be arranged with the approval of the adviser. This includes appropriate grounding in research methodology and communication theory; it includes training in one or more communication media; and, it includes the equivalent of a minor in a related field—or a cohesive group of courses in several fields.
- 3. Students in Broadcasting and Film, upon completion of academic work, including the independent project, must pass a comprehensive written examination, after which they spend a three-month internship with a professional film or broadcasting organization. (No tuition is charged for the internship period.) Academic work will include 100a and b, appropriate 105 and 110 courses, 215, 220, 310, 311, and 312.

No particular specialization in undergraduate work is expected of a candidate. Special programs of study may be arranged for individual candidates, which will take account of the nature of their previous preparation.

#### DOCTOR OF PHILOSOPHY

The Department offers the Doctor of Philosophy degree in Communication, with programs in Mass Communication Research, in Developmental Communication, and in Public Affairs Communication.

In addition to fulfilling the course and residence requirements for the degree, Ph.D. candidates are required to:

- 1. Complete requirements for a Master's degree in Communication, and complete a research project. Holders of the Master's degree may be excused from this first year research requirement if the faculty feels that the previous research has been sufficient.
- 2. Pass a comprehensive written examination in the subjects required of all candidates and in the area of advanced specialty of the particular candidate.
- 3. Demonstrate reading knowledge of a foreign language. Except by special permission, this language will be Russian, French, or German.
- 4. Pass the University oral examination, which may be either a comprehensive examination covering the same areas as the written examination or a defense of the dissertation.
- 5. Complete at least one year of research experience in the Institute for Communication Research, or in comparable research activities.
- 6. Have some familiarity with at least one medium of mass communication. Such familiarity may be obtained prior to graduate study by working for a communication medium. Students without such practical experience will be expected to take some media-oriented courses, such as the Summer Radio-Television-Film Institute or journalism courses, as part of their graduate program.
- 7. Complete a dissertation satisfactory to an advisory committee of three or more members and to the University Committee on the Graduate Division.

The following is an example of a typical Ph.D. program in Mass Communication Research. The curriculum for Developmental Communication is virtually identical, but includes a sequence in developmental psychology and a dissertation in the area of how people, as they mature, learn to use and in turn are influenced by the mass media.

### I. Communication Theory

Comm. 211. Theory of Communication I Comm. 212. Theory of Communication II Comm. 213. Theory of Communication III

#### 2. Methodology

Comm. 217. Research Methods I Comm. 218. Research Methods II Comm. 219. Research Methods III C.S. 126. Computing for Nonscientists

#### 3. Statistics

Psych. 60. Statistical Methods Psych. 152. Analysis of Data Stat. 161. Statistical Methodology

4. Experimental Psychology (at least two of the following)

Psych. 103a. Experimental Psychology: Higher Mental Processes Psych. 103b. Experimental Psychology: Perception Psych. 103c. Experimental Psychology: Animal Learning

Psych. 103d. Experimental Psychology:

Social Processes

Social Psychology and Personality
 Psych. 212. Advanced Social Psychology
 Psych. 261. Seminar in Social Psychology
 Psych. 220. Human Motivation
 Psych. 213. Advanced Personality

#### 6. Sociology

Sociol. 137. Advanced Organizational Behavior Sociol. 161. Advanced Interpersonal Behavior Sociol. 165. Advanced Social Stratification

Preparation for examinations and for the dissertation should include selected courses from among the following:

Comm. 220. Mass Communications in Society

Comm. 255. International Communication

Comm. 256. Communication in Economic and Social Development

Psych. 209. Advanced Perception

Psych. 210. Advanced Learning
Psych. 211. Advanced Developm

Psych. 211. Advanced Developmental Psychology

Psych. 221. Organizational Processes and Task Performance

Psych. 251. Psychopathology

Psych. 254. Principles of Behavioral Modification I

Psych. 267. Seminar in Interpersonal Processes

Phil. 157a,b. Logic

Phil. 164. Philosophy of Science

Stat. 206, 207. Mathematical Models in Behavioral Sciences

Anthr. 167. Language and Culture

Anthr. 158. Culture and Personality

Pol.Sci. 382a, 382b. Research Seminar in Political Behavior

Pol.Sci. 312. Research Seminar in Comparative Politics—Problems in Politics of Development

Other courses and special advanced reading courses may be selected in conference with the adviser.

The following is an example of a typical Ph.D. program in Public Affairs Communication:

#### 1. Communication Theory

Comm. 211, 212. Sequence in Communication Theory

2. Structure and Function of the Mass Media

Comm. 220. Mass Communications in Society

Comm. 230. Mass Media and Government

Comm. 240. Economics of the Mass Media Comm. 255. International Communication

#### 3. Methodology

Comm. 217, 218. Sequence in Research Methods

Comm. 227. Analysis of Documentary Evidence

#### 4. Statistics

Psych. 60. Statistical Methods, or Stat. 50. Elementary Statistics One other statistics course

#### 5. Law

Law 104. Law in Society

6. Political Science, History, Economics — a unified program of five courses in one of these fields, and three courses in one or both of the others. Suggested:

Pol.Sci. 108. Seminar in Administrative Responsibility

Pol.Sci. 152. Modern Political Thought Pol.Sci. 158. Theoretical Foundations of Political Sociology Pol.Sci. 170. The Supreme Court and the Constitution

Pol.Sci. 211. Seminar in the Theory of Comparative Politics

Pol.Sci. 312. Research Seminar on Comparative Politics

Pol.Sci. 321. Advanced Seminar on British Political Systems

Pol.Sci. 383a. Research Seminar in Political Behavior

Pol.Sci. 383b. Research Seminar in Political Behavior

Political Behavior
Hist. 32. Twentieth Century Europe

Hist. 93. East Asian Civilizations—The recent period.

Hist. 122a. Russian Foreign Policy 1700–1917

Hist. 122b. Russian Foreign Policy Since 1917

Hist. 164. A Political History of the American People since 1914

Hist. 166. American Intellectual History: Nineteenth Century

Hist. 167. American Intellectual History: Twentieth Century

Econ. 117. Economic History of the United States

Econ. 118. Underdeveloped Economies Econ. 120. Comparative Economic Systems

Econ. 158. Organization and Social Control of Industry

Econ. 165. International Economics Econ. 200. Topics in the History of Economic Thought

Econ. 215. Economic Development I Econ. 216. Economic Development II

7. Selected courses from these and other departments chosen in consultation with an adviser, in preparation for the degree examinations and the dissertation.

Ph.D. candidacy expires five years after admission to candidacy by the University Committee on the Graduate Division. Reapplication will require reexamination.

Other programs leading toward the Ph.D. and involving communication may be pursued in the Graduate Division Special Programs. Such programs are individually planned for unusually well-qualified students.

Minor for the Degree of Doctor of Philosophy—Candidates for the degree of Doctor of Philosophy in other departments who

elect a minor in Communication will be required to complete a minimum of 15 units of graduate courses in the Communication Department, including one research methods course and either Communication 211 or Communication 212. The Communication 217 requirement may be waived when comparable research methodology courses have been taken in some other department. The remainder of the course program will be adapted to the particular needs of each candidate.

# THE INSTITUTE FOR COMMUNICATION RESEARCH

The Institute for Communication Research operates as an office of project research for the faculties of the Department of Communication and other departments, on grants from foundations, communication media, and other agencies, on government contracts, and on its own funds. A few research assistantships are available to qualified graduate students. Among the qualifications which will be highly valued in applicants are high scholarship, training in the behavioral sciences (preferably psychology and sociology, including training in statistics and research methodology), and training for or experience with the mass media. For further information about the Institute write to the Director.

## Courses Open to Undergraduates and Graduates

#### I. GENERAL

#1. Mass Communication and Society — An introductory survey of the structure, functions, philosophy, process, and effects of mass and interpersonal communication in modern society. Taught from a behavioral science perspective. Open to non-majors.

5 units, Win (Parker) MTW 10 and section

70. Introduction to Survey Research — An introductory course in survey research methods. Formulation of problems, study design, sampling, interviewing, data processing and analysis, and writing of reports of public opinion surveys. Designed primarily for undergraduate non-majors. Prerequisite: Psychology 60 or equivalent.

3 units, Spr (Maccoby)

190. Comparative Communication Systems — Foreign press, broadcasting, and film: their control and support; their relations to economic and social development, political systems, and cultural patterns; and their roles in public opinion and national policy.

4 units, Spr (Schramm) by arrangement

199. Individual Work—Major students with high academic standing are permitted to undertake individual work.

1 to 4 units, any quarter (Staff) by arrangement

#### II. JOURNALISM

50. Editorial Techniques I — Theory and techniques of news communication for newspapers and radio-TV; analysis of journalist's audience; representative media; journalistic vocations. To be taken concurrently with Communication 51. Open to non-majors.

3 units, Aut (Rivers) MWF 10 Spr (Clark) MWF 9

51. Editorial Techniques I Laboratory — Practice in news writing. Weekly conferences, laboratory, outside assignments. To be taken concurrently with Communication 50. Open to non-majors. Prerequisite: typing skill of 35 words per minute.

1 unit, Aut (Rivers) by arrangement Spr (Clark) by arrangement

107. Editorial Techniques II — Copy editing, headline writing, news display, illustration, typography, printing processes. To be taken concurrently with Communication 108. Prerequisites: 50 and 51.

3 units, Win (Weigle) MWF 9

108. Editorial Techniques II Laboratory—Work includes editing daily teleprinter report of Associated Press or United Press International. To be taken concurrently with Communication 107.

2 units, Win (Clark) by arrangement

115. Advertising I — Fundamentals of marketing, consumer research, media, copy, layout. Open to non-majors.

3 units, Aut (Blankenburg) MWF 11

116. Advertising II—Analysis of advertising campaigns in marketing, public relations. Advanced practice in copywriting, media selection, retail advertiser service. Prerequisite: 115.

3 units, Win (Blankenburg) MWF 11

140. History of Anglo-American Journalism
—Open to non-majors.

3 units, Aut (Weigle) TTh 9 4 units, Sum (——) by arrangement

150. Forms of Journalistic Writing — Practice in writing magazine articles, with emphasis on marketing manuscripts. Conferences. Prerequisites: 50 and 51 or consent of instructor.

3 units, Win (Rivers) TTh 11 4 units, Sum (——) TTh 10

152. Magazine Editorial Techniques—Planning, writing, production studied with local magazine editors, correspondents; industrial editing. Prerequisite: 150, consent of instructor.

3 units, Spr (Rivers) Th 4:15-6:05

169. Legal Aspects of Journalism — Libel, contempt, constitutional guaranties, privacy, copyright, inspection of public records. Open to non-majors.

3 units, Spr (Clark) MW 11

175. Reporting of Public Affairs — Local, state, federal courts; municipal, state, federal administration in the local community. Open only to major students with senior standing.

4 units, Win (Clark) MWF 10

#### Practice Courses

121. Advanced Practice — Practice work in executive positions on editorial or business staff of *The Stanford Daily, Quad,* and *Chaparral*; weekly conferences. Open to undergraduate students who qualify by election or appointment; not open to graduate students. Students limited to total of 7 units credit. Credit may *not* be offered in fulfillment of Communication unit requirements for degrees in communication.

1 to 2 units, each quarter (Staff) by arrangement

183. San Francisco Newspaper Practice — Majors who have made a high record in their entire program, and especially in 175, are permitted to work in San Francisco in the senior year, by arrangement with San Francisco newspapers. Work is under supervision of specially appointed San Francisco newspapermen and faculty of the Department.

5 units, Spr (Weigle) by arrangement

#### III. BROADCASTING AND FILM

100a. Elements of Audio Communication— The use of sound for broadcasting and film. To be taken concurrently with 100b.

3 units, Aut (----) MW 10-12

100b. Elements of Visual Communication—Production for film and television. To be taken concurrently with 100a.

3 units, Aut (---) MW 1:15-3:05

105a. Radio Production — Elementary course in which students study local radio programs and produce their own shows. Prerequisites: 100a and consent of instructor.

4 units, Win (----) TTh 1:15-3:05

105b. Television Production — Elementary course in which students study local television shows and work out their own productions in a San Francisco studio. Prerequisites: 100a and 100b and consent of instructor

4 units, Win (----) MW 1:15-3:05

105c. Film Production—A beginning course in which students produce their own short films. Prerequisites: 100a and 100b and consent of instructor.

4 units, Win (----) TTh 10-12

110a. Advanced Radio—Primarily for graduate students working on radio projects for their degree or producing for broadcasting. Admission by recommendation of instructor only. Prerequisites: 100a and 105a.

3 units, Spr(----) T 1:15-4:05

110b. Advanced Television — Primarily for graduate students producing television projects for a degree. Admission by recommendation of instructor only. Prerequisites: 100a and 100b and 105b.

3 units, Spr (----) W 1:15-4:05

110c. Advanced Film—Primarily for graduate students producing film projects for a degree. Admission by recommendation of instructor only. Prerequisites: 100a and 100b and 105c.

3 units, Spr (----) Th 1:15-4:05

123. Basic Writing for Broadcasting and Film.

3 units, Aut (----) TTh 10-12

124. Writing for Film and Broadcast Production.

3 units, Win (----) MW 10-12

125. Advanced Writing for Film and Broadcasting.

3 units, Spr (----) M 1:15-3:05

141. History of Film—Studies in the development of the motion picture as an art form and a means of communication. Lab.: Screenings of films announced in class.

4 units, Spr (Breitrose) MWF 9; lab. by arrangement

142. Broadcast Communication — The development of American broadcasting and its contemporary problems.

3 units, Spr (----) TTh 9

180. Broadcasting and Film Criticism — The techniques and role of criticism based upon the objectives and potential of these media. For advanced students. Prerequisite: consent of instructor.

3 units, Spr (----) MWF 11

#### Summer Radio-Television-Film Institute

201S. Noncommercial Station Operation — (Same as Education 341s; see Summer Session Bulletin.) A course taught in the studios of KQED for advanced students who wish to learn the philosophy, administration, origination, planning, and coordination of noncommercial television programs.

3 units, Sum (KQED Staff) by arrangement

203S. Teaching by Television — (Same as Education 342s; see Summer Session Bulletin.) The growing impact of television as an instrument of education; the challenge and specific requirements of teaching by television; the utilization of educational program material telecast by commercial and non-commercial stations. Laboratory work in campus classroom studio with video tape playback and evaluation.

3 units, Sum (Staff) by arrangement

204S. Modern Broadcasting—The key questions of broadcasting from the viewpoint of station management, programming and sales in relations with government, personnel, ratings, and sponsors. Emphasis on FM, multiplexing, modern production methods, and international broadcasting. Laboratory work through one unit of 204Sa taken concurrently.

<sup>3</sup> units, Sum (KNBR Staff) by arrangement

204Sa. Radio Laboratory — Direct application of the radio course work will be made

through the student management and operation of the University station, KZSU. Two weeks' on-the-air experience in all forms of broadcasting including management, program planning, engineering, production and performance. All students registered for 204S must take at least one unit of this course. It may be taken separately from 204S for 1–2 units. Recommended for all students.

1 unit, Sum (Staff) by arrangement

205S. Film Production — Basic theory and techniques of film making. Individual student productions from script to release print. Cameras, lighting, sound, editing. Limited to 15 students. Students with prior work in film production may register for Communication 299, Advanced Individual Work, 1-4 units, with the consent of the instructor.

4 units, Sum (Staff) by arrangement

207S. Radio and Television Writing—Theory and practice in writing for radio and television. Special emphasis on the documentary and other nondramatic forms.

3 units, Sum (Staff) by arrangement

209S. Radio and Television News—Practical course to train students for work in the radio and television newsroom; gathering, selection, rewriting, editing and reporting of news for broadcast and TV newsfilm; production and direction of feature material and special events broadcasts. Students handle news department of KZSU.

3 units, Sum (KNBR Staff) by arrangement

211S. Commercial Television Programming—Theory and practice of program planning and scheduling. Community, sponsors, ratings, and competition in relation to programming decisions. Analysis of film versus live and local versus network. Lecture and demonstration including problems of remoterpick-ups.

3 units, Sum (KPIX Staff) by arrangement

214S. Television Production — Practice in television planning, direction, and performance through student production of a variety of program types, both educational and commercial. Programs are video taped for analysis and criticism.

3 units, Sum (KPIX Staff) by arrangement

Mass Communications in Society — See Communication 220. Required of all students.

#### Courses for Graduates

201. Process and Effects of Communication —Lectures on the theory of communication, and on the experimental, survey, and analytical literature of the field. To be taken with one of the related seminar courses: 202, 203, 211, or 215.

2 units, Aut (Schramm) M 2:15-4:05

202. Process and Effects of Print Media Communication — Theory of communication process for journalism A.M. candidates. To be taken concurrently with Communication 201.

3 units, Aut (Parker) W 2:15-4:05

203. Process and Effects of Communication — Theory of communication process for A.M. candidates in communication research. To be taken concurrently with Communication 201.

3 units, Aut (Paisley) W 2:15-4:05

207. Survey of Communication Research Methods—Research designs, sampling, data collection, and data analysis. For A.M. students.

5 units, Win (Chu) MW 4:15-6:05

211. Theory of Communication I—Seminar and tutorial meetings, extensive readings and papers. For doctoral candidates planning to continue with the sequence on theory. To be taken concurrently with Communication 201.

3 units, Aut (Schramm) W 2:15-4:05

212. Theory of Communication II—Theory of the communication process. Analysis of the experimental literature in attitude change. Prerequisite: consent of instructor.

5 units, Win (Maccoby) MW 2:15-4:05

213. Theory of Communication III — Theory of communication in groups and communication networks. The theory of information and meaning. Analysis of the literature. Prerequisite: consent of instructor.

5 units, Spr (----) M 2:15-4:05, and additional meetings by arrangement

215. Process and Effects of Broadcasting and Film Media of Communication—Theory of communication process for A.M. stu-

dents in broadcasting and film. To be taken concurrently with Communication 201.

3 units, Aut (Breitrose) Th 7-10 p.m.

217. Communication Research Methods I—Methods of research in mass, group, and interpersonal communication. Application of scientific method to communication research. Design of communication studies for laboratory and field experiments and sample surveys. Conceptualization of variables, sampling, data collection, interview techniques, data processing and data analysis. Report preparation. Prerequisite: previous or concurrent registration in elementary statistics.

4 units, Aut (Parker) TTh 2:15-4:05

218. Communication Research Methods II —Continuation of 217.

4 units, Win (Maccoby) TTh 2:15-4:05

219. Communication Research Methods III—Continuation of 218.

4 units, Spr (Paisley) TTh 2:15-4:05

220. Mass Communications in Society — The nature and social responsibilities of the media, the structure of the industry, problems of regulation, management, educational and commercial interests. For first-year graduate students.

3 units, Spr (Rivers) T 4:15–6:05 Sum (Staff) by arrangement

227. Analysis of Documentary Evidence. 4 units (Staff) by arrangement

230. Mass Media and Government. 5 units (Staff) by arrangement

240. Seminar in Mass Media History. 4 units (Staff) by arrangement

245. Economics of the Mass Media. 4 units (Staff) by arrangement

255. International Communication — Chief patterns of mass communications throughout the world; philosophies behind them; economic, social, political reasons why a given kind of pattern develops where it does; channels by which nations, cultures communicate with each other; kinds of barrier which intervene in those channels; manipulative communication between nations which is characteristic of the "cold war."

4 units, Spr (Chu) M 2:15-4:05

256. Communication in Economic and Social Development — Seminar on the com-

munication problems of economic and social development, and on the uses of the mass media for national integration, social change, and education in the developing countries. Special uses and difficulties of communication research in these countries. Case studies and planning exercises.

3 to 5 units, Spr (Schramm) T 4:15-6:05

270. Advanced Communication Theory and Method Seminar — May be repeated for credit. Prerequisites: 219 and 213.

3 units, Aut, Win, Spr (Parker, Staff) by arrangement

275. Communication Research: Content Analysis and Scaling — Techniques of reducing and ordering data. Manual and computerized content analysis. Scaling procedures of Thurstone, Likert, Guttman, Lazarsfeld, Shepard, and others. Prerequisites: 2 quarters of statistics, Comm. 219 or equivalent background in methodology, and consent of the instructor.

4 units, Aut (Paisley) TTh 2:15-4:05

299. Advanced Individual Work—Graduate majors may supplement certain courses with individual projects of distinctly advanced order.

1 to 5 units, any quarter (Staff) by arrangement

300. Thesis.

6 to 10 units (Staff) by arrangement

309. Directed Graduate Project—Research in connection with a staff project, in lieu of Master's thesis.

3 to 6 units (Staff) by arrangement

310. Seminar in Broadcasting and Film. 2 units, Aut (----) by arrangement

311. Seminar in Broadcasting and Film. 2 units, Win (----) by arrangement

312. Seminar in Broadcasting and Film. 2 units, Spr (——) by arrangement

# COMPUTER SCIENCE

Acting Executive Head: John G. Herriot Professors: George B. Dantzig, George E. Forsythe (on leave 1966-67), John G. Herriot, John McCarthy, William F. Miller. Visiting: Friedrich L. Bauer (winter quarter), James H. Wilkinson (winter quarter)

Associate Professors: Edward A. Feigenbaum, Gene H. Golub

Assistant Professors: Joyce B. Friedman, Richard W. Watson, Niklaus E. Wirth

Lecturers: Gene M. Amdahl, Robert T. Braden, John C. Butcher, Harwood G. Kolsky, Bertram Raphael, Arthur L. Samuel

Research Associates: Kenneth M. Colby, Lester D. Earnest, Aram J. Grayson

Affiliated Faculty:

Professors: Kenneth J. Arrow (Economics and Statistics), Robert V. Oakford (Industrial Engineering)

Associate Professor: Arthur F. Veinott, Jr. (Industrial Engineering)

#### OFFERINGS AND FACILITIES

The Department aims to acquaint a variety of students with the technological and intellectual roles of automatic digital computers, and to educate research workers in computer science. In spite of the diversity of the applications, the methods of attacking problems with computers show a considerable unity, and computer science is concerned with the underlying principles. The field is still young, and the student will find many more questions than answers.

Of the numerous areas of computer science, the Department has competence in numerical analysis, operations research, artificial intelligence, computational linguistics, programming systems and languages, logical design of computer systems, and computer control of external devices.

Courses in data processing are offered by the Industrial Engineering Department and in the Graduate School of Business. Courses in optimization and mathematical programming will mainly be found in the Operations Research Program.

Since computer science is inherently interdisciplinary, graduate students of computer science are expected to include in their study program a good deal of work in other departments; see the list of suggested courses below.

There is no Bachelor's degree in computer science. Undergraduates who wish to enter the field are advised to major in mathematics and include Computer Science 136, 137, 138, and 139 in their course of study.

In connection with its courses and research, the Department makes considerable use of the Computation Center. See the sec-