MUSIC

Emeriti: (Professors) John M. Chowning, Albert Cohen, William L. Crosten, George Houle, Wolfgang E. Kuhn, William H. Ramsey, Leonard G. Ratner, Sandor Salgo, Leland C. Smith; *(Professors, Performance)* Arthur P. Barnes, Marie Gibson, Andor Toth
Chair: Thomas Grey
Professors: Karol Berger, Brian Ferneyhough, Jonathan Harvey (Winter)
Associate Professors: Jonathan Berger, Chris Chafe, Thomas Grey, Stephen Hinton (on leave 2000-01), William P. Mahrt, Julius O. Smith
Assistant Professors: Mark Applebaum, Heather Hadlock (on leave 2000-01), Melissa Hui (on leave 2000-01), Tobias Plebuch
Professor (Research): Max V. Mathews
Associate Professors (Teaching): George Barth (Piano), Stephen Sano (Director of Choral Studies)
Associate Professor (Performance): Karla Lemon (Director of Orchestras)
Senior Lecturers: Stephen Harrison (Violoncello), Gennady Kleyman (Violin, Viola), Jennifer Lane (Voice), Gregory A. Wait (Voice), Frederick R. Weldy (Piano)
Lecturers: Giancarlo Aquilanti (Theory, Symphonic Band), Talya Berger (Theory), Fredrick Berry (Jazz Ensemble), Frances Blaisdell (Flute), Mark Brandenburg (Clarinet), Marjorie Chauvel (Harp), Robert Claire (Baroque Flute), Floyd O. Cooley (Tuba), Laura Dahl (Resident Collaborative Pianist), John Dornenburg (Viola da Gamba), Charles A. Ferguson (Guitar), Claire Giovannetti (Voice), Dawn Harms (Violin), Alexandra Hawley (Flute), Robert Hubbard (Oboe), Joyce Johnson-Hamilton (Trumpet), Jay Kadis (Audio Recording), McDowell Kenley (Trombone), Fernando Lopez-Lezcano (CCRMA), Janet Maestre (Flute), Anthony Martin (Baroque Violin), James Matheson (Oboe), John McGinn (Theory), Robert Huw Morgan (Organ), Bruce Moyer (Contrabass), Herbert Myers (Early Winds), James Nadel (Jazz), Rufus Olivier (Bassoon), Larry S. Ragent (French Horn), Malcolm Slaney (CCRMA), Harold Stein (Saxophone), Frank Sumares (Jazz Piano), Elaine Thornburgh (Harpsichord), Linda Uyechi (Taiko), Mark Veregge (Percussion), Timothy Zerlang (Piano)
Artists in Residence (St. Lawrence String Quartet): Marina Hoover (Cello), Geoff Nuttall (Violin 1), Lesley Robertson (Viola), Barry Shiffman (Violin 2)
Acting Assistant Professor: Jane Alden
Consulting Professors: Marina Bosi (Computer Research in Music and Acoustics), Walter Hewlett (Computer-Assisted Research in the Humanities), Eleanor Selfridge-Field (Computer-Assisted Research in the Humanities)
Visiting Professor: John R. Pierce (emeritus)
Mellon Fellow: David Code

The Department of Music's aims are to provide specialized training for those who plan careers in music as composers, performers, teachers, and research scholars; and to promote the understanding and enjoyment of music in the University at large through its courses and abundant performance offerings.

Varied opportunities for instrumental and vocal study and performance are available to majors and nonmajors alike. Students wishing to obtain individual instruction, to participate in chamber music, or to play in department ensembles should note that auditions are held during registration week in Autumn Quarter. While there may be openings in some private studios for qualified students during other quarters, it is to the student's advantage to audition in autumn, as most slots are filled for the entire year.

The department is housed in Braun Music Center, Dinkelspiel Auditorium, and The Knoll, including two theaters for concert and recital productions, two rehearsal halls, and a small chamber hall. Pianos, organs, harpsichords, and a variety of early stringed and wind instruments are available for student use. In addition, advanced students may use fine old stringed instruments and bows from the Harry R. Lange Historical Collection.

The Music Library contains a comprehensive collection of complete editions, scores, books, and recordings. Supplementing this is the Stanford Memorial Library of Music, an invaluable collection of musical manuscripts and first editions, and the Archive of Recorded Sound.

For more information on the Department of Music, see the Music home page (http://www.stanford.edu/group/Music).

The Doreen B. Townsend Center for Computer Research in Music and Acoustics (CCRMA) provides one of the top-rated facilities for digital sound research in the world. It includes a large distributed computing facility, recording, and editing studio; MIDI-based small-systems studios; and work areas with audio-related peripherals. CCRMA software consists of a vast set of programs and system tools for editing, viewing, synthesizing, and analyzing sound. For a detailed and up-to-date description of the hardware and software available, contact the CCRMA office, or see their home page (http://ccrma-www.stanford.edu).

The Center for Computer-Assisted Research in the Humanities (CCARH), located in Braun Music Center, conducts research focused on constructing computer databases for music and on creating programs that allow student and staff researchers to access, analyze, print, and electronically perform the music. For more information, see their home page (http://ccrma-www.stanford.edu/CCARH).

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The undergraduate major in Music is built around a series of foundation courses in theory, musicianship, and music history, in addition to performance and the proficiency requirements outlined below. Because of the sequence of courses, it takes more than two years to complete the requirements for the major. Prospective majors are urged to consult the undergraduate student-services officer in the department as early as possible in order to plan a program which allows sufficient time for major course work, practice, and University requirements outside the major. Early planning is especially important for students wishing to double-major, for those contemplating overseas study during their undergraduate years, for those wishing to do an in-depth concentration in the music major, and for those with particular musical talents and interests. All required courses for the A.B. in Music and in the Music, Science, and Technology specialization must be taken for a letter grade. Electives may be taken credit/no credit, but any courses taken towards concentration requirements must also carry a letter grade.

1. Students are required to include the following foundation courses in their programs:
   a) Theory: Music 21, 22, 23
   b) History: Music 40, 41, 42, and three from the series 140-145
   c) Analysis: Music 121 and two from 122A,B,C
2. Additionally, music majors must fulfill the following two performance requirements:
   a) Individual studies in performance: five quarters.
   b) Ensemble: five quarters of work in one or more of the department's organizations or chamber groups. Music 157 (Mariachi Band) does not satisfy this requirement.
3. Majors are required to pass a Piano Proficiency examination as a part of the requirements to complete Music 23. Offered at the end of the Autumn and Spring quarters or at other times by appointment, it consists of scales and arpeggios, performance of a simple tune (to be set by the examiner), sight reading, and the performance of prepared pieces (consult the Music office for details). Remedial skills are taught in Music 12A,B,C. The successful completion of this examination is a prerequisite for all higher-level theory and analysis courses (Music 121, 122A,B,C).
4. Majors must also pass an Ear Training Proficiency examination, which is part of the requirements to complete Music 23 or can be taken by arrangement, demonstrating a student's ability to hear music accurately and to perform it at sight. The successful completion of the examination is a prerequisite for all higher-level theory and analysis courses (Music 121, 122A,B,C).

RECOMMENDED SCHEDULE FOR THE MUSIC MAJOR

The following sample schedule shows how a student may include substantial work on a major in music while also fulfilling the University General Education Requirements during the freshman and sophomore years. The schedule also includes foreign language study, which is strongly recommended for all music majors and especially for those expecting to continue into graduate work in any area of music.

FIRST YEAR

Course No. and Subject	*A*	*W*	*S*
Freshman English	3		3
Music 19 (if needed), 21, 22	(3)	4	4
Individual Instruction and/or Ensemble	1-4	1-4	1-4
Introduction to the Humanities	3-5	3-5	3-5
Choice of Foreign Language, General Education Requirement, or Stanford Introductory Seminar	3-5	3-5	3-5

SECOND YEAR

Music 23, 40; 41, 121; 42	8	8	4
Individual Instruction and/or Ensemble	1-4	1-4	1-4
General Education Requirement, or Stanford Introductory Seminar	3-5	3-5	3-5
Elective	(3)	(3)	(3)

THIRD AND FOURTH YEARS

Three from Music 140-145 and two from 122A, B, or C	4-8	4-8	4-8
Elective	(4)	(4)	(4)

MUSIC, SCIENCE, AND TECHNOLOGY

The specialization in Music, Science, and Technology is designed for those students with a strong interest in the musical ramifications of rapidly evolving computer technology and digital audio, and in the acoustic and psychoacoustic foundations of music. The program entails a research project under faculty guidance and makes use of the highly multidisciplinary environment at CCRMA. This program can serve as a complementary major to students in the sciences and engineering.

1. Students in the program are required to include the following courses in their studies:
   a) Theory: 21, 22, 23, 121, 151 (WIM) (4 units); 150 (3 units); 220A,B,C (4 units each); 250A (4 units)
   b) History: two from 40, 41, 42
   c) Applied: individual studies in performance (two quarters) or Music 192A,B; and Ensemble or 192C (5 units)
   d) Research project: 220D (4 units)
2. Students in Music, Science, and Technology must also pass the Piano and Ear-training Proficiency examinations required of all Music majors.

MINORS

Minors in Music and in the Music, Science, and Technology specialization provide the student with a core of essential music courses in the disciplines which establish both a foundation for informed appreciation of music and a basis for more advanced study, should the student wish to pursue it.

MUSIC

Course No. and Subject	*Units*
Music 21, 22, 23. Elements of Music	12
Music 40, 41, 42. Music-History Survey	12
Choice of one (writing-intensive courses):	
Music 140-145. Studies in Music History	4
Two quarters:	
Music 158-171. Ensemble	2
Music 172-177. Individual Instruction	6
Academic Elective in Music	4
Total	40

MUSIC, SCIENCE, AND TECHNOLOGY

Music 21, 22, 23. Elements of Music	12
Music 150. Musical Acoustics	3
Music 151. Psychophysics and Cognitive Psychology for Musicians	4
Music 220A. Fundamentals of Computer-Generated Sound	4
Two quarters:	
Music 192A,B. Theory and Practice of Audio Recording	6
Music 192C. Session Recording (1 or 2 units/qtr.)	3
Academic Elective in Computer Music	4
Total	36

CONCENTRATIONS

Concentrations are offered in performance, conducting, composition, or history and theory. In each concentration, 6 additional course units in the area of concentration beyond the basic requirements for the major are required. In addition, each concentrator registers for an independent project (198, 4 units) in the senior year under faculty supervision, leading to a senior recital, a composition, a conducting project, or a senior research paper. Specific guidelines and information on the concentration tracks are available from the Department of Music office.

HONORS PROGRAM

Honors in music is awarded by the faculty to concentrators who have produced an independent project of exceptional quality and meet certain department standards in musicianship, scholarship, and academic standing. The conferral of honors is done solely through faculty consultation. Students do not petition for honors.

OVERSEAS STUDIES

Courses in music are often available at overseas Stanford programs, especially in Berlin and Moscow. See the Overseas Studies Program section of this bulletin immediately following this section for this year's listings. Music majors and minors should talk to the Department of Music undergraduate administrator prior to going overseas.

GRADUATE PROGRAMS

University requirements for the A.M., D.M.A., and the Ph.D. are described in the "Graduate Degrees" section of this bulletin.

The following statements apply to all the graduate degrees described below, unless otherwise indicated.

Admission—Applicants are required to submit evidence of accomplishment (scores, tapes, and/or research papers, according to the proposed field of concentration) when they return the application form. Applicants should arrange to take the Graduate Record Examination (GRE) well in advance of the December 30 application deadline. All applicants, except those applying for the A.M. in Music, Science, and Technology (A.M./MST), are also required to submit a departmental entrance test in theory and musicianship, which is sent along with the application. All components of the application are due by December 30.

Department Examinations—All entering graduate students except those in the A.M./MST program are required to take: (1) a diagnostic examination testing the student in theory (counterpoint, harmony, and analysis) and the history of Western music, and (2) a proficiency examination in sight-singing and piano sight-reading given at the beginning of study in the department (usually the week before school begins).

None of Stanford's required undergraduate courses may be credited toward an advanced degree unless specifically required for both degrees. Only work that receives a grade of 'A,' 'B,' or 'Satisfactory' (a passing grade in an *instructor-mandated* pass/no credit course) in music courses taken as a graduate student is recognized as fulfilling the advanced-degree requirements. Students may need to devote more than the minimum time in residence if preparation for graduate study is inadequate.

MASTER OF ARTS

Residence—A minimum of three quarters of full-time study (considered to be 12 units per quarter in the Department of Music) in residence is required for both master's degrees in Music.

MUSIC

Foreign-Language Requirement—Reading knowledge of a language other than English, and the ability to translate into idiomatic English, must be demonstrated in the first quarter of graduate study.

Study Program—Students may concentrate in composition, history, or performance practice. To be recommended for the A.M. degree, a candidate must complete a program of 36 units of graduate course work. Depending on the concentration, the A.M. project will be an investigative essay, a composition, or a demonstration of performance supported by a written commentary on the performance practice involved.

Required are:

Course No. and Subject	*Units*
Music 200. Graduate Proseminar	4
Three quarters of work in the student's area of concentration	9-12
Three quarters of ensemble performance	3
Music 299. Master of Arts Project	4
Music 323. Composition Seminar *or*	4
Music 269A. Performance Practices Seminar	4

Students in the doctoral program who enter directly from the bachelor's level may, upon completion of the above requirements and the doctoral qualifying examination, be recommended for the A.M. degree. The A.M. project (Music 299) is not required of these students.

MUSIC, SCIENCE, AND TECHNOLOGY

This is a one-year program of 36 units focusing on the integration of music perception, music-related signal processing and controllers, and synthesis. The program is designed for students having an undergraduate engineering or science degree or a degree that includes course work in engineering mathematics.

Required are:

Music 151. Psychophysics and Cognitive Psychology for Musicians	4
Music 192A. Foundations of Sound-Recording Technology	3
Music 192B. Advanced Sound-Recording Technology	3
Music 220A. Fundamentals of Computer-Generated Sound	4
Music 220B. Compositional Algorithms, Psychoacoustics, and Spatial Processing	4
Music 220C. Seminar in Computer-Music Research	4
Music 250A. HCI Theory and Practice	4
Music 250B. HCI Performance Systems	4
Music 320. Introduction to Digital Audio Signal Processing and the Discrete Fourier Transform	2
Music 420. Applications of the Fast Fourier Transform	2
Music 421. Signal Processing Methods in Musical Acoustics	2
Total	36

DOCTORAL PROGRAMS

Residence—The candidate must complete a minimum of three years of full-time (12 units or more per quarter) work. Generally, it takes more than three years due to part-time (9 units per quarter) study during the second, third, and fourth years, when the student also acts as a Teaching Assistant or Predoctoral Research Affiliate (see Residency under the "Graduate Degrees" section of this bulletin). Doctoral candidates working on Ph.D. dissertations or Doctor of Musical Arts (D.M.A.) final projects that require consultation with faculty members continue enrollment in the University under Terminal Graduate Registration (TGR), after they have reached the required residency units for that category.

Foreign-Language Requirement—At the time of advancement to candidacy, all D.M.A. and Ph.D. students in the Computer-Based Theory and Acoustics program are required to have demonstrated a reading knowledge of a language other than English and the ability to translate into idiomatic English. Ph.D. candidates in Musicology are required to demonstrate proficiency in German and a similar competence in a second language, chosen from French, Italian, or Latin (or, on a case-by-case basis, another language, if it has significant bearing on the candidate's field of study).

Qualifying Examination—A written and oral examination for admission to candidacy is given just prior to the fourth quarter of residence for D.M.A. and Ph.D. students in the Computer-Based Music Theory and Acoustics programs; for Ph.D. students in Musicology, the exams are given just prior to the seventh quarter of residence. This exam tests knowledge of history, theory, repertory, and analysis.

Teaching—All students in the Ph.D. or D.M.A. degree programs, regardless of sources of financial support, are required to complete six quarters of their supervised teaching at half time. Music 280 (given in Autumn Quarter) is a required course for Teaching Assistants.

Basic Requirements—Doctoral programs in the Department of Music do not require the A.M. degree as a prerequisite. All students entering directly from the bachelor's degree level are required to take the following course (which is, however, required of *all* students in musicology, regardless of entering degree level):

Course No. and Subject	*Units*
200. Graduate Proseminar	4

All doctoral candidates must take:

301A,B,C. Music Analysis: Modal, Tonal, and Post-Tonal	12

DOCTOR OF MUSICAL ARTS IN COMPOSITION

The Doctor of Musical Arts (D.M.A.) degree in Composition is given breadth through collateral studies in other branches of music and in relevant studies outside music as seems desirable. A minimum of 72 units of credit is required for the degree.

Examinations—A written examination in the candidate's special area of concentration is given no later than the seventh quarter after passing the qualifying examination. A public lecture-demonstration is also required during the last quarter of residence. It should be one hour in length, treating aspects of the final project.

Requirements—Besides those requirements listed above, candidates are expected to produce a number of works demonstrating their ability to compose in a variety of forms and for the common media: vocal, instrumental, and electronic music. If possible, the works submitted are presented in public performance prepared by the composer. Annual progress is reviewed by the composition faculty. The final project in composition is an extended work for instruments, voices, electronic media, or a combination of these. Music 323, Doctoral Seminar in Composition (16 units) is a required course.

DOCTOR OF PHILOSOPHY

The Ph.D. in Music can be pursued in two concentrations: Musicology or Computer-Based Music Theory and Acoustics.

Examinations—

1. Special Areas: a written and oral examination testing the student's knowledge of music and research in the area of special concentration is given no later than the seventh quarter after passing the qualifying examination. This includes an oral defense of the dissertation proposal. The examining committee comprises prospective readers of the dissertation.
2. Ph.D. Orals: the University oral examination, taken once the dissertation is substantially underway, is an oral presentation and defense of dissertation research methods and results.

Requirements—Besides those requirements listed above, Music 221A and B, History of Music Theory (8 units), are required courses for all Ph.D. students. Other requirements by concentration are:

MUSICOLOGY

Course No. and Subject	*Units*
269A. Seminar in Performance Practices	4
300A,B. Seminar in Notation	8
310. Research Seminars in Musicology*	24-40
312A,B. Aesthetics and Criticism of Music	8

* The requirement is for eight seminars of 3-5 units each. Students may petition to take up to two graduate seminars in other departments, in consultation with their adviser.

COMPUTER-BASED MUSIC THEORY AND ACOUSTICS

220A,B,C. Computer-Generated Music Seminars	12
220D. Research in Computer Music	12
320. The Discrete Fourier Transform	4

JOINT Ph.D. IN MUSIC AND HUMANITIES

The department participates in the Graduate Program in Humanities leading to a joint Ph.D. degree in Music and Humanities. For a description of the program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

Many Department of Music courses have pages on the World Wide Web, which are linked to the Music home page (see above). Courses with Web pages at press time are noted in their entries below.

GENERAL

1. Introduction to Music—Techniques of active listening for an enhanced understanding of various musical styles. Awareness of the basic elements of music is applied to the appreciation of Western art music from the Middle Ages to the present, and to traditions of popular and non-Western music. Questions of musical form, style, expression, and meaning are compared in different historical and cultural contexts.

3 units, not given 2000-01

2A. The Symphony—Symphonic literature 1750 to the present, emphasizing developing skills in critical listening. Ability to read music not required.

3 units, not given 2000-01

2B. The Concerto

3 units, not given 2000-01

2C. Opera—For all opera-goers. The history of opera, from the genre's beginnings around 1600 to the 20th century. Representative repertory works by major composers (Monteverdi, Gluck, Mozart, Weber, Verdi, Wagner, Stravinsky, et al.). See web site.

3 units, not given 2000-01

3C. Medieval Music

3 units, not given 2000-01

3F. Franz Liszt and the Music of the Romantic Era

3 units, not given 2000-01

4A. The Music of J. S. Bach—Develops awareness and skill in listening to the music of Bach: structure, style, instruments, and aesthetics. Music for the church and chamber: dance music, concerti, cantatas, sonatas, preludes and fugues, and passions.

3 units, not given 2000-01

4B. The Music of Mozart

3 units, not given 2000-01

4C. The Music of Beethoven—The musical works of Ludwig van Beethoven in the context of his life and times. The role of a "classical" heritage (the style of Haydn and Mozart) in Beethoven's musical development, his participation in an emerging Romantic view of music and the arts, the impact of Enlightenment thought and the French Revolution (and its cultural-political consequences) on Beethoven's music, psychoanalytic interpretations of the composer's biography, the critical reception of the composer in the 19th and 20th centuries and its relation to Romantic and Modernist ideologies of music and aesthetics.

3 units, not given 2000-01

4F. The Music of Stravinsky

3 units, not given 2000-01

5A. Music in America—The development of popular, folk, and art music in America from the Pilgrims to the present. See Web site.

3 units, not given 2000-01

7B. Explorations in World Music—Introduction to select musical traditions of the world, examining diverse musical languages, styles, and aesthetics within their cultural and social contexts. Develops critical listening and analytic skills in understanding each tradition, focusing on the perception of musical time. Hands-on workshops.

3 units, not given 2000-01

11,13,14,15,16,17. Stanford Introductory Seminars

14N. Stanford Introductory Seminar: Technology and the Arts—Preference to freshmen. An investigation into the sometimes simbiotic, sometimes adversarial relationship between art and technology. Broad historical view of the affect of science and technology on the arts and vice versa, with emphasis on digital technology and music. Lectures, demonstrations, film screenings, and critical discussions. GER:3a (DR:7)

3 units, Spr (J. Berger)

14Q. Stanford Introductory Seminar: Music and Poetry—Preference to sophomores. The ancients called poetry lyric to be sung to the lyre; they considered it inseparable from music, but there is also ancient precedent for the view that poetry contains its own kind of music. The setting of lyric poetry to music, in songs of the Troubadours of the Middle Ages, lute songs, and madrigals of the Renaissance, Lieder of the German Romantics, French chansons of the late 19th and early 20th centuries. The study of poetry for its inherent musicality; of the music for the ways it realizes and develops that musicality and for what music adds above and beyond the poetry. Recommended: basic ability to read musical notation. GER:3a (DR:7)

3 units, Win (Mahrt)

15Q. Stanford Introductory Seminar: Debussy and the Music of French Impressionism—Preference to sophomores. The music evolving out of the poetic school of Symbolism and the artistic movement of Impressionism in France. An examination of the social and cultural settings for these movements, and of their creative products, providing a foundation for the study of its music. Focus is on the music of Claude Debussy, whose contributions helped define the artistic revolutions of the early 20th century. Careful listening to representative works is the basis for discussions and projects.

3 units, Win (Cohen)

16Q. Stanford Introductory Seminar: Ki ho'alu—The New Renaissance of Hawaiian Musical Tradition—Preference to sophomores. The Hawaiian tradition of Slack-Key Guitar, Hawaiian history and the culture surrounding its development, and subsequent evolution. Hands-on experience, reading, discussion, and workshops. Recommended: guitar-playing abilities. GER:3a,4b (DR:3 or 7)

3 units, Aut (Sano)

17N. Stanford Introductory Seminar: The Operas of Mozart—Preference to freshmen. Four of Mozart's mature operas have held the stage uninterruptedly since their premieres, the earliest works in the operatic repertoire never to go out of fashion. What accounts for this extraordinary staying power? Close reading of selected operas, with attention to the history of their composition, performance, and reception, and to their changing significance from Mozart's time to ours. GER:3a (DR:7)

3 units, Win (K. Berger)

18. Jazz History

18A. Ragtime to Bebop (1900-1940)—From the beginning of jazz to the war years. GER:3a (DR:7)

3 units, Win (Berry)

18B. Bebop to Present (1940-)—Modern jazz styles from Bebop to the current scene. Emphasis is on the significant artists of each style. GER:3a (DR:7)

3 units, Spr (Berry)

19. Introduction to Music Theory—For non-music majors and music majors or minors unable to pass the proficiency test for entry to 21. The fundamentals of music theory and notation, basic sight reading, sight singing, ear training, keyboard harmony; melodic, rhythmic, and harmonic dictation. Skill oriented, using piano and voice as basic tools to develop listening and reading skills. See web site. GER:3a (DR:7)

3 units, Aut, Spr (T. Berger)

20A. Jazz Theory—Introduces the language and sounds of jazz through listening, analysis, and compositional exercises. Students apply the fundamentals of Western music theory to the study of jazz. Prerequisite: 19 or consent of instructor. GER:3a (DR:7)

3 units, Aut (Nadel)

20B. Advanced Jazz Theory—Analysis of a variety of approaches to improvisation through listening and transcribing, and developing familiarity with important contributors to this music. Topics: scale theory, altered dominants, and substitute harmony. Prerequisite: 20A or consent of instructor.

3 units, Win (Nadel)

20C. Jazz Arranging and Composition—Jazz arranging and composition for small ensembles. Foundation for writing for big band. Prerequisite: 20A or consent of instructor.

3 units, not given 2000-01

111. Perspectives in North American Taiko—The musical, cultural, historical, and political perspectives of taiko through drumming, readings, discussion, workshops, and original research. Japanese music and Japanese American history: relations between performance, cultural expression, community, and identity. GER:3a,4b (DR:3 or 7)

4 units, Spr (Sano, Uyechi)

127. Instrumentation and Orchestration—Study of individual instruments, instrumental groups within the orchestra, and combinations of groups. Arrangements from piano music to orchestral music. Score analysis with respect to orchestration. Practical exercises using chamber ensembles and school orchestra. Prerequisite: 23.

3 units, Spr (Aquilanti)

187. The Work of Art and the Creation of Mind—(Enroll in Education 200.)

4 units, Win (Hannah, Rehm, Ross, Sano)

FOUNDATION FOR A.B. MAJOR

21,22,23. Elements of Music—Melody, harmony, counterpoint, and rhythm are studied through analysis, composition, and exercises in practical musicianship. Emphasis is on tonal theory with components in melody, counterpoint, and harmony. Analytical and practical musicianship skills are taught, with analysis and compositional projects in historical styles. Students with previous training in theory should take a placement exam given at the beginning of each quarter for admission to more advanced courses.

21. Elements of Music I—Introduction to tonal theory. Practice and analysis. Diatonic harmony focusing on melodic and harmonic organization, functional relationships, voice-leading, and tonal structures. Development of ear-training and keyboard-harmony skills; acquisition of a variety of analytical methods and development of listening strategies. Students intending to continue with 22-23 who do not have piano proficiency should begin 12 (class piano) concurrently. See web site. Enrollment limited to 40. Prerequisite: pass proficiency examination in basic musical skills given on first day of class (students who do not pass have the option of taking Music 19). GER:3a (DR:7)

4 units, Aut (Applebaum)
Win (Alden)

22. Elements of Music II—Introduction to chromatic harmony focusing on secondary functions, modulations, harmonic sequences, mode mixture, the Neapolitan and augmented sixth chords. Analysis of musical forms and harmonizations is complemented by harmonic and melodic dictation, sight singing, and other practical skills. See web site. Prerequisite: 21 or consent of instructor. GER:3a (DR:7)

4 units, Win (McGinn)
Spr (Alden)

23. Elements of Music III—Continuation of chromatic harmoy, complex forms, and introduction to early 20th-century techniques. Satisfactory passage of ear-training proficiency exam, part of the course's final, is a requirement for course completion and for continuation in the major sequence. Passage of departmental piano-proficiency exam is also required to pass this course. Prerequisite: 22 or consent of instructor. GER:3a (DR:7)

4 units, Aut (Aquilanti)
Spr (Staff)

40,41,42. Music History—The history of Western art music from Gregorian chant to the present, stressing major styles and genres in their intellectual and institutional settings.

40. Music History to 1600—Prerequisite: 23 (may be taken concurrently). GER:3a (DR:7)

4 units, Aut (Alden)

41. Music History 1600–1830—Prerequisite: 40. GER:3a (DR:7)

4 units, Win (Plebuch)

42. Music History since 1830—Prerequisite: 41. GER:3a (DR:7)

4 units, Spr (Code)

121. Analysis of Tonal Music—Complete movements, or entire shorter works of the 18th and 19th centuries, are analyzed in a variety of theoretical approaches. Prerequisites: 23, successful completion of the ear-training and piano-proficiency examinations. GER:3a (DR:7)

4 units, Aut (Barth)

122A. 18th-Century Counterpoint—Analysis and composition of two- and three-part inventions and three- and four-voice fugues. Use of keyboard, ear training, and sight singing underlies all written work. Prerequisites: 23, successful completion of the ear-training and piano-proficiency examinations.

4 units, Win (Aquilanti)

122B. Harmonic Materials of the 19th Century—Analysis of 19th-century music, with compositional exercises based on 19th-century models. Prerequisites: 121 or consent of instructor, successful completion of the ear-training and piano-proficiency examinations.

4 units, Spr (McGinn)

122C. Introduction to 20th-Century Composition—Analysis of contemporary works, with an emphasis on music since 1945. Projects in free composition based on 20th-century models. Prerequisites: 121 or consent of instructor, successful completion of the ear-training and piano-proficiency examinations.

4 units, Aut (Ferneyhough)

COMPOSITION

123. Undergraduate Seminar in Composition—Weekly discussion on current trends in composition. May be repeated for credit. Prerequisite: music major, and 23 or consent of instructor.

3 units, Win (Applebaum)

125. Individual Undergraduate Projects in Composition—Individual projects in creative work. May be repeated for credit. Prerequisites: music major, and at least one quarter of 123.

1-3 units, Aut, Win, Spr (Staff)

323. Doctoral Seminar in Composition—Illustrated discussions of compositional issues and techniques. Students present their own work to the class, and individually to the instructor.

4 units, Aut (Ferneyhough)
Win (Harvey)
Spr (Applebaum)

325. Individual Graduate Projects in Composition

1-5 units, Aut, Win, Spr (Staff)

HISTORY AND LITERATURE

140,141,142,143,144,145. Seminars in Music History—Specialized topics in music history are each offered at least once within any two-year period. Topics vary each year. May be repeated for credit.

140. Studies in Medieval Music—Prerequisite: 40. (WIM)
4 units, Aut (Mahrt)

141. Studies in Renaissance Music—Prerequisite: 40. (WIM)
4 units, Win (Alden)

142. Studies in Baroque Music—Prerequisite: 41. (WIM)
4 units, Spr (Plebuch)

143. Studies in Classic Music—Prerequisite: 41. (WIM)
4 units, alternate years, given 2001-02

144. Studies in Romantic Music—Prerequisite: 42. (WIM)
4 units, alternate years, given 2001-02

145. Studies in Modern Music—Prerequisite: 42. (WIM)
4 units, alternate years, given 2001-02

146. Keyboard Fantasias of the 17th and 18th Centuries—For upper-class undergraduates and graduate students. The *Fantasia*, the paradigmatic genre of free compositional style, experimental in the 17th and 18th centuries, was often avantgardistic with respect to musical form, harmony, meter, counterpoint, and virtuosity, and sometimes notated without bar lines or disseminated as examples of improvisations for other composers, organists, and even amateurs. Performance practice and style history in works by J. S. and C. P. E. Bach, Froberger, Sweelinck, Mozart, and others. See web site.
3 units, not given 2000-01

147. Hindemith—For upper-class undergraduates and graduate students. Introduction to the work of Paul Hindemith (1895-1963); selected works from his oeurve; his achievements in the broader context of 20th-century music history. Aim is an informed reassessment of this controversial figure. Prerequisite: 42 or consent of instructor.
3 units, not given 2000-01

148. Shakespeare in 19th-Century Music—For upper-class undergraduates and graduate students. Romantic music was profoundly literary in its inspiration, and Shakespeare was the single most literary presence in the music of 19th-century Europe, in opera, and in a wide variety of instrumental music (Beethoven, Berlioz, Mendelssohn, etc.). The musical uses of Shakespeare; discussion of the changing ideas of musical drama and the nature and limits of musical expression, representation, and "narrative." Plays: *Romeo and Juliet, Hamlet, Macbeth, Othello, King Lear, Measure for Measure*, and *Merry Wives of Windsor* in the context of the musical works of the time.
3 units, not given 2000-01

149. Instrumental Music with Electronics—For upper-class undergraduates and graduate students. The link between the "traditional" evolution of instrumental, orchestral, and vocal music and the revolutionary world of the electronic studio occurs in works where the two are combined. Focus is on such linking works, from Stockhausen's contributions to the products of IRCAM (Boulez, Murail), etc. Prerequisite: ability to read contemporary scores.
3 units, not given 2000-01

221. History of Music Theory—The principal theories, theorists, and treatises of Western music. A survey of issues and controversies. Two-quarter sequence.

221A. *4 units, alternate years, given 2001-02*

221B. *4 units, alternate years, given 2001-02*

240,241,242,243,244,245. Seminars in Music History—For graduate students. Topics as in 140-145. Participation in upper-class seminars, with additional in-depth research. Specialized topics in music history are each offered at least once within any two-year period. Topics vary each year.

240. Studies in Medieval Music
4 units, Aut (Mahrt)

241. Studies in Renaissance Music
4 units, Win (Alden)

242. Studies in Baroque Music
4 units, Spr (Plebuch)

310. Research Seminar in Musicology—For graduate students. Specialized topics vary each quarter.
3-5 units, Aut (Code)
Win (Plebuch)
Spr (Grey)

312A,B. Aesthetics and Criticism of Music—For graduate students. Selected primary texts focusing on the nature, purposes, and uses of music and other arts.

312A. Ancients and Moderns: Plato to Nietzsche
4 units, Aut (K. Berger)

312B. Contemporaries: Heidegger to Today
4 units, Win (K. Berger)

COMPUTER MUSIC AND APPLICATIONS

150. Musical Acoustics—The elementary physics of vibrating systems, waves, and wave motion. Time- and frequency-domain analysis of sound. Room acoustics, reverberation, and tuning systems. The acoustics of musical instruments—voice, strings, and winds. Emphasis is on the practical aspects of acoustics in making music. Hands-on and computer-based lab. Prerequisites: music performance/composition experience, basic algebra, and physics. GER:3a (DR:7)
3 units, not given 2000-01

151. Psychophysics and Cognitive Psychology for Musicians—Basic concepts and experiments relevant to the use of sound, especially synthesized, in music. Introduction to elementary concepts. Listening to sound examples. Emphasis is on salience and the importance of various auditory phenomena in music. Prerequisite: some basic knowledge of music. GER:3a (DR:7) (WIM)
4 units, Spr (J. Berger)

192. Theory and Practice of Audio Recording

192A. Foundations of Sound Recording Technology—For upper-class undergraduates and graduate students; preference given to music majors with MST specialization. Topics: elementary electronics, the physics of sound transduction and microphone operation, selection and placement; mixing consoles; connectors and device interconnection; grounding and shielding; the principles of analog magnetic recording; operation maintenance of recording equipment; the basic principles of recording engineering. Enrollment limited. Prerequisites: 151; algebra, physics basics, and consent of instructor.
3 units, Aut (Kadis)

192B. Advanced Sound Recording Technology—Topics: noise reduction techniques; dynamics and time-delay audio effects; the principles of digital audio; disk- and tape-based digital recorders; digital audio workstations and editing; advanced multitrack techniques; SMPTE and MIDI time code and device synchronization; MIDI sequencing and synchronization. Prerequisite: 192A.
3 units, Win (Kadis)

192C. Session Recording—Independent engineering of recording sessions. May be repeated for credit. Prerequisites: 192A,B.
1-2 units, Aut, Win, Spr (Kadis)

220. Computer-Generated Music

220A. Fundamentals of Computer-Generated Sound—Techniques for digital sound synthesis, effects, and reverberation. Topics: summary of digital synthesis techniques (additive, subtractive, nonlinear, wavetable, spectral-modeling, and physical-modeling); digital effects algorithms (phasing, flanging, chorus, pitch-shifting, and

vocoding); and techniques for digital reverberation. Majors (undergraduate or graduate) must take for 4 units. Prerequisite: 22 or equivalent, or consent of instructor.

2-4 units, Aut (Chafe)

220B. Compositional Algorithms, Psychoacoustics, and Spatial Processing—The use of high-level programming language as a compositional aid in creating musical structures. Studies in the physical correlates to auditory perception and a review of psychoacoustic literature. Simulation of a reverberant space and control of the position of sound within the space. Prerequisite: 220A.

4 units, Win (Lopez-Lezcano)

220C. Seminar in Computer-Music Research—Individual projects in composition, psychoacoustics, or signal processing. See web site. Prerequisite: 220B.

4 units, Spr (Chafe)

220D. Research—Independent research projects in composition, psychoacoustics, or signal processing. May be repeated for credit. Prerequisite: 220C.

1-4 units, any quarter (Staff)

250. Seminar in Human/Computer Interfaces for Musical Purposes—If student is also taking the full 220 series, both 250A and B must be taken before 220C.

250A. HCI Theory and Practice—HCI issues as they relate to music applications in composition and performance. Project-oriented, examining issues from the technical and theoretical perspectives of computer science, haptics, and music theory.

4 units, Aut (J. Berger, Mathews)

250B. HCI Performance Systems—Continuation of 250A, concentrating on interactive computer-music performance systems. Prerequisite: 250A.

4 units, Win (J. Berger, Mathews)

252. Seminar: Topics in Computer Music—Elective seminar with varying topics each offering. See web site.

1-3 units, not given 2000-01

253. Musical Information: An Introduction—The kinds of musical information used in sound, graphical, and analytical applications. Emphasis is on independent concepts and principles in music representation and research objectives (repertory analysis, performance analysis, theoretical models, similarity, and stylistic simulation). Examples from Western art music. Prerequisites: one year of music theory or equivalent; "methods" courses in such fields as musical analysis, symbolic systems, information processing, sound engineering, or intellectual-property issues.

1-4 units, Win (Selfridge-Field)

254. Seminar: Musical Representation and Computer Analysis—Participants explore the issues introduced in 253 in greater depth and take initiative for research projects related to a theoretical or methodological issue, a software project, or a significant analytical result. Prerequisite: 253 or consent of instructor.

1-4 units, Spr (Selfridge-Field)

319. Research Seminar on Computational Models of Sound Perception—Weekly research seminar on all aspects of auditory perception, often with a emphasis on computational models. Topics: music perception, signal processing, auditory models, pitch perception, speech, binaural hearing, auditory scene analysis, basic psychoacousitcs, and neurophysiology.

1-3 units, Aut, Win, Spr (Slaney)

320. Introduction to Digital Audio Signal Processing and the Discrete Fourier Transform (DFT)—Introduction to the mathematics of digital signal processing and spectrum analysis for music and audio research. Topics: complex numbers, sinusoids, spectra, aspects of audio perception, the DFT, and basic Fourier time-frequency relationships in the discrete-time case. See web site.

2-4 units, Aut (J. Smith)

420. Applications of the Fast Fourier Transform (FFT) in Digital Audio Signal Processing—Spectrum analysis and signal processing using FFT, with emphasis on audio applications. Topics: FFT windows; cyclic and acyclic convolution; zero padding and other spectrum analysis parameters; FIR filter design; phase and channel vocoders; the overlap-add and filter-bank-summation methods for short-time Fourier analysis, modification, and resynthesis; tracking sinusoidal peaks across FFT frames; modeling time-varying spectra as sinusoids plus filtered noise; FFT-based sound synthesis; brief overviews of and introductions to transform coders (as used in MPEG audio compression), perfect-reconstruction filter banks, and wavelet transforms. See web site. Prerequisite: 320 or Electrical Engineering 261, or equivalent. Recommended: Electrical Engineering 264.

2-4 units, Win (J. Smith)

421. Signal Processing Methods in Musical Acoustics—Computational models of musical instruments, primarily in the wind and string families, based on physical models implemented using signal processing methods. The models are designed to capture only the "audible physics" of musical instruments using computationally efficient algorithms. Topics: mass-spring systems and their discrete-time simulation, sampled traveling waves, lumping of losses and dispersion, delay-line interpolation methods, applications of allpass filters and lattice/ladder digital filters in acoustic models, models of winds and strings using delay lines, scattering junctions, digital filters, and nonlinear junctions implementing oscillation sources such as bow-string and reed-bore couplings. See web site. Prerequisites: 150 or equivalent; Electrical Engineering 264.

2-4 units, Spr (J. Smith)

422. Perceptual Audio Coding—The history and basic principles: the development of psychoacousitcs-based data-compression techniques; perceptual-audio-coder applications (radio, television, film, multimedia/internet audio, DVD, EMD). In-class demonstrations: state-of-the-art audio coder implementations (e.g., AC-3, MPEG, etc.) at varying data rates; programming simple coders. Topics: audio signals representation; quantization; time to frequency mapping; introduction to psychoacoustics; bit allocation and basic building blocks of an audio codec; perceptual audio codecs evaluation; overview of MPEG-1, 2, 4 audio coding; overview of other coding standards (AC-3 etc.). Prerequisites: knowledge of digital audio principles; familiarity with C programming. Recommended: 320 and/or Electrical Engineering 261.

3 units, Win (Bosi)

423. Graduate Seminar in Signal Processing Research—See web site.

1 unit, Aut, Win, Spr (J. Smith)

PERFORMANCE

GROUP INSTRUCTION

Note—Special fee of $85 per quarter (subject to revision) for 12A,B,C (non-majors); 65A,B,D; 72, 73, 74, 75, 76, 77.

12A,B,C. Piano Class (Beginning)—(A=level 1; B=level 2; C=level 3) Preference given to music majors.

1 unit, Aut, Win, Spr (Zerlang)

65A,B. Voice Class I, II—Group (7 students to a section) beginning voice for the non-major (A = level 1; B = level 2).

1 unit, Aut, Win, Spr (Giovannetti)

65C. Voice Class—For music majors and non-majors who are members of departmental choral ensembles.

1 unit, Aut, Win, Spr (Wait)

72,73,74,75,76,77. Small-Group Intermediate-Level Instruction—Minimum enrollment required. May be repeated for credit.
1 unit, Aut, Win, Spr

72A. Piano Class—For intermediate students. Prerequisites: 12C or equivalent, audition.
(Zerlang)

72B. Organ Class—For beginning organ students who have keyboard skills.
(R. Morgan)

72C. Harpsichord Class—For beginning harpsichord students who have keyboard skills.
(Thornburgh)

72D. Jazz Piano Class—By invitation only; priority to majors and jazz-ensemble participants.
(Sumares)

73. Voice Class—For intermediate students. Admission by audition.
(Wait, Giovannetti)

74C. Classical Guitar Class
(Ferguson)

74D. Harp Class
(Chauvel)

75A. Flute Class
(Staff)

75B. Renaissance Wind Instruments Class
(Myers)

76. Brass Instruments Classes
(Kenley)

77. Percussion Class
(Veregge)

INDIVIDUAL INSTRUCTION

172/272, 173/273, 174/274, 175/275, 176/276, 177/277. Individual Vocal and Instrumental Instruction—270-level courses are for advanced students. Special fee of $165 per quarter for majors and $330 for non-majors (subject to revision). Prospective students must demonstrate, by audition with the appropriate teacher, a minimum proficiency on instrument. Minimum proficiency requirements for each instrument are available at department office. May be repeated for credit.
3 units, Aut, Win, Spr

172/272. Keyboard Instruments

172A/272A. Piano
(Barth, Dahl, Schultz, Weldy)

172B/272B. Organ
(R. Morgan)

172C/272C. Harpsichord
(Thornburgh)

172D/272D. Jazz Piano—By invitation only; priority to majors and jazz-ensemble participants.
(Sumares)

172E/272E. Early Piano
(Barth)

173/273. Voice
(Giovannetti, Lane, Wait)

174/274. Stringed Instruments

174A/274A. Violin
(Kleyman, Harms, Nuttall, Shiffman)

174B/274B. Viola
(Kleyman, Robertson)

174C/274C. Violoncello
(S. Harrison, Hoover)

174D/274D. Contrabass
(Moyer)

174E/274E. Viola da Gamba
(Dornenburg)

174F/274F. Classical Guitar
(Ferguson)

174G/274G. Harp
(Chauvel)

174H/274H. Baroque Violin
(Martin)

174I/274I. Early Plucked Strings
(Staff)

175/275. Woodwind Instruments

175A/275A. Flute
(Blaisdell, Hawley, Maestre)

175B/275B. Oboe
Aut (Hubbard)
Win, Spr (Matheson)

175C/275C. Clarinet
(Brandenburg)

175D/275D. Bassoon
(Olivier)

175E/275E. Renaissance Wind Instruments
(Myers)

175F/275F. Saxophone
(Stein)

175G/275G. Baroque Flute
(Claire)

176/276. Brass Instruments

176A/276A. French Horn
(Ragent)

176B/276B. Trumpet
(Johnson-Hamilton)

176C/276C. Trombone
(Kenley)

176D/276D. Tuba
(Cooley)

177/277. Percussion
(Veregge)

PERFORMANCE PRACTICES

126. Introduction to Thoroughbass—The development of continuo techniques and skills for figured-bass realization. Performance and analysis of selected repertoire, using thoroughbass principles and exercises based on historical theoretical treatises. Prerequisite: 22.
3 units, Win (T. Berger)

130. Elementary Conducting

130A. Introduction to Conducting—The fundamentals of baton techniques and rehearsal procedures. The development of coordination of the members of the body involved in conducting; fluency in the various beat patterns and meters; dynamics, tempi, cueing, and use of the left hand in conducting. Prerequisites: 121 and diagnostic musicianship exam given first day of class; preference given to students who have also completed 122B.
3 units, alternate years, given 2001-02

130B. Elementary Orchestral Conducting—Techniques specific to the conducting of orchestral ensembles. Prerequisites: 127 or previous orchestral performance experience, 130A.
3 units, alternate years, given 2001-02

130C. Elementary Choral Conducting—Techniques specific to the conducting of choral ensembles: warm-ups, breathing, balance, blend, choral tone, isolation principles, recitative conducting, preparation, and conducting of choral/orchestral works. Prerequisite: 130A.
3 units, alternate years, given 2001-02

181. Performance of Vocal Literature—Expands the student's knowledge of classical solo voice music, and develops critical listening facilities and communicative performing abilities. Listening: introduction to a diverse vocal repertoire; distinguishing qualities of technique and interpretation. Performing: understanding and communicating text, style. Meant to accompany individual instruction in voice (173/273). Autumn: Bach arias from Cantatas, performed with orchestra at Memorial Church. Winter: chamber operas performed in concert version. Spring: chamber operas performed on stage (continuation of winter). Enrollment limited by audition. May be repeated for credit. See web site.
1 unit, Aut, Win, Spr (Lane)

182. Diction for Singers—The International Phonetic Alphabet and its application to German, French, and Italian vocal literature. Open also to pianists interested in vocal coaching and choral conducting.
1 unit, Win (Dahl)

183. Art Song Interpretation—For advanced singers and pianists as partners. Performance class in a workshop setting. Prerequisite: consent of instructor. Recommended: 170 or 182.

183A. German Lied—Including composers from Beethoven and Schubert to Wolf and Strauss.
1 unit, alternate years, given 2001-02

183B. French mélodie—Including composers from Fauré and Debussy to Ravel and Poulenc.
1 unit, Spr (Dahl)

230. Advanced Orchestral Conducting—May be repeated for credit. Prerequisite: 130B.
2-4 units, Aut, Win, Spr (Lemon)

231. Advanced Choral Conducting—May be repeated for credit. Prerequisite: 130C.
2-4 units, Aut, Win, Spr (Sano)

269A. Seminar in Performance Practices—Performance techniques, theoretical principles, aesthetics, and musical resources of various historical periods.
4 units, alternate years, given 2001-02

270. Graduate Seminar in 20th-Century Performance Practice
4 units, not given 2000-01

ENSEMBLE

An audition is required for admission to any University musical ensemble; audition schedules are posted during the registration period in Autumn Quarter. Audition is by appointment in Winter and Spring quarters: contact the ensemble director. Membership is open to all students including those who do not register for credit, although these courses may be repeated for credit. Many Department of Music ensembles tour on a regular basis, usually after commencement in June.

157. Introduction to Mariachi Ensemble—Introduction to the practice of mariachi music, tradition, and history. Focus is on learning traditional *sones*, *rancheras*, *huapangos*, and *boleros*. Requirements: ability to play, and access to intruments (violin, trumpet, guitar, vihuela, and guitarron). (AU)
1 unit, Aut, Win, Spr (Rodriguez)

158. Contemporary Performance Ensemble—Alea II. A workshop for performance of works by Stanford and contemporary composers. Rehearsals arranged according to performance requirements. One concert per quarter.
1 unit, Aut, Win, Spr (Lemon)

159. Early Music Singers—Small choir specializing in medieval, Renaissance, and early Baroque vocal music. One major concert per quarter.
1 unit, Aut, Win, Spr (Mahrt)

160. University Orchestra—70- to 100-member ensemble performing major orchestral works; minimum one concert per quarter.
1 unit, Aut, Win, Spr (Lemon)

161. University Bands

161A. Symphonic Band—40- to 50-member ensemble performing transcriptions of symphonic, brass band music, and repertoire composed specifically for symphonic band. One concert per quarter.
1 unit, Aut, Win, Spr (Aquilanti)

161B. Jazz Orchestra—Big-band format. Repertoire drawn primarily from the contemporary jazz-ensemble literature. One formal concert per quarter.
1 unit, Aut, Win, Spr (Berry)

Note—The Leland Stanford Junior University Marching Band is now under the aegis of the Department of Athletics. See the "Athletics, Physical Education, and Recreation" section in this bulletin.

162. Symphonic Chorus—100- to 150-voice ensemble, performing major choral masterworks with orchestra. One concert per quarter.
1 unit, Aut, Win, Spr (Sano)

163. University Choir—Official choir of Memorial Church, furnishing music for Sunday services and special occasions in the church calendar.
2 units, Aut, Win, Spr (Wait)

165. Stanford Chamber Chorale—Select 24-voice chamber ensemble, specializing in virtuoso choral repertoire from all periods of Western classical music.
1 unit, Aut, Win, Spr (Sano)

167. University Singers—Mixed-repertory chorus, performing a variety of choral repertoire from all periods of Western classical music and from other world cultures.
1 unit, Aut, Win, Spr (Sano)

169. Stanford Taiko—Select North-American taiko ensemble, performing traditional and contemporary repertoire for Japanese drums. Multiple performances in Winter and Spring quarters, also touring; instrument construction and maintenance.
1 unit, Aut, Win, Spr (Sano)

170. Collaborative Piano—Performance class in a workshop setting. Techniques of collaboration with vocalists and instrumentalists in repertoire ranging from songs and arias to sonatas and concertos. Prerequisite: private-lesson proficiency level in piano, or consent of instructor.
1 unit, Aut (Dahl)

171. Chamber Music—Small combinations for strings, winds, and keyboard instruments. Open to students at the private-lesson-proficiency level to hone ensemble skills, preferably while taking private lessons. Selected string-instrument participants are invited to participate in a chamber orchestra, led by members of the St. Lawrence String Quartet, without conductor. Spring Quarter: chamber orchestra specializing in contemporary repertoire led by members of the St. Lawrence and conducted by Karla Lemon. All new and returning students are required to audition.
1 unit, Aut, Win, Spr (Staff)

UNDERGRADUATE DIRECTED READING AND RESEARCH

198. Concentrations Project—For concentration program participants only. Must be taken in senior year.
4 units, Aut, Win, Spr (Staff)

199. Independent Study—For advanced undergraduates and graduate students who wish to do work outside the regular curriculum. Before registering, student must present specific project and enlist a faculty sponsor.

1-4 units, Aut, Win, Spr (Staff)

GRADUATE RESEARCH AND SPECIAL STUDIES

200. Graduate Proseminar—Required of first-year graduate students in music. Introduction to research in music, bibliographical materials, major issues in the field, philosophy, and methods in music history. Guest lecturers and individual research topics.

4 units, Aut (K. Berger, Nagy)

269B. Research in Performance Practices—Directed reading and research.

1-5 units, Aut, Win, Spr (Staff)

280. TA Training Course—Required for doctoral students serving as Teaching Assistants. Orientation to resources at Stanford, guest presentations on the principles of common teaching activities, supervised teaching experience. Students should take 280 in the second year, as they begin teaching. See web site.

1 unit, Aut (Ben-Tal)

299. Master of Arts Project

4 units, Aut, Win, Spr (Staff)

300A,B. Seminar in Notation—Western notation of the Middle Ages and Renaissance: principles, purposes, and transcription.

300A. Medieval Notation

4 units, Spr (Mahrt)

300B. Renaissance Notation

4 units, not given 2000-01

301. Music Analysis—Current analytical trends, issues, and methods. Intensive analysis of selected works.

301A. Modal Analysis

4 units, Spr (Mahrt)

301B. Tonal Analysis

4 units, Aut (Barth)

301C. Post-Tonal Analysis

4 units, Win (Ferneyhough)

302. Research in Musicology—Directed reading and research.

1-5 units, Aut, Win, Spr (Staff)

321. Readings in Music Theory—Directed reading and research.

1-5 units, Aut, Win, Spr (Staff)

341. Ph.D. Dissertation

1-9 units, Aut, Win, Spr (Staff)

399. D.M.A. Final Project

1-9 units, Aut, Win, Spr (Staff)

OVERSEAS STUDIES

The following courses are taught overseas at the campus indicated. Students are encouraged to discuss with their major advisers on campus which courses would best meet individual educational needs. Descriptions can be found in the "Overseas Studies Program" section of the bulletin or in the Overseas Studies Program office, 126 Sweet Hall.

BERLIN

2M. Opera

3 units, Spr (Hinton)

112M. Thomas Mann's Novel *Doktor Faustus*

4 units, Spr (Hinton)

MOSCOW

178/278. Individual Vocal and Instrumental Instruction

3 units, Aut (Orbelian)