Microbiology and Public Health — Management of Courses

832. **Bacterial Diversity Laboratory**  
Spring of odd-numbered years. 2(0-0)  
M PH 831 or concurrently.  
Representative groups of bacteria will be isolated and studied.

842. **Advanced Soil Microbiology**  
Fall of odd-numbered years. 3(3-0)  
M PH 426 or approval of department. Interdepartmental with the Department of Crop and Soil Sciences.  
Biochemistry, biology, and community ecology of microorganisms indigenous to soil. Emphasis on current research problems.

843. **Soil Microbiology Laboratory**  
Fall of odd-numbered years. 2(0-6)  
M PH 842 concurrently or approval of department. Interdepartmental with the Department of Crop and Soil Sciences.  
Fundamental techniques of dealing with microorganisms indigenous to soil. Metabolic activity of microorganisms. Interaction between microorganisms and plants.

890. **Special Problems in Microbiology**  
Fall, Winter, Spring. Summer. 2 to 6 credits. May reenroll for a maximum of 12 credits. Approval of department.

899. **Master's Thesis Research**  
Fall, Winter, Spring. Summer. Variable credit. Approval of department.

900. **Topics in Microbiology**  
Fall, Winter, Spring. 2(2-0) May reenroll for a maximum of 12 credits if different topics are taken. Approval of department.  
Topics will be selected from taxonomic subdisciplines such as bacteriology, virology, protozoology, mycology, algology, and helminthology, and from transecting disciplines such as microbial genetics, immunology, physiology, and ecology.

999. **Doctoral Dissertation Research**  
Fall, Winter, Spring. Summer. Variable credit. Approval of department.

101. **Introduction to the Military Profession**  
(M S 121.) Fall, Winter, Spring. 1(1-1)  
Approval of department.  
Analysis of the military profession from several academic perspectives. Exploration of the technical, ethical, and personal ramifications of service as an officer in the U.S. Army. Lab introduces military skills.

102. **Military Leadership I**  
(M S 401A.) Winter. 1(1-1) M S 101 or approval of department.  
Introduction to military leadership. Draws upon examples from military history to illustrate what a military leader must be, know, and do to lead soldiers in battle. Lab includes both military skills and leadership applications.

103. **Army Physical Fitness Training**  
Spring. 1(0-3) M S 102 or approval of department.  
The leader's role in implementing the Army Physical Fitness Program to provide for the physical well being of subordinates. Individual and group fitness programs are introduced. Includes rappelling and small arms rifle marksmanship.

201. **Military First Aid**  
(M S 221.) Fall. 1(1-1) M S 103 or approval of department.  
Emergency first aid techniques including casualty evaluation, life-saving measures, CPR, and environmental injury prevention. Lab includes military skills and first aid applications.

202. **Military Leadership II**  
(M S 401B.) Winter. 1(1-1) M S 201 or approval of department.  
Descriptive model of small unit leadership. Provides cadets with a realistic preview of the small unit leader's role in the Army. Lab includes small unit drill and ceremonies.

203. **Land Navigation**  
(M S 223.) Spring. 1(1-2) M S 202 or approval of department.  
Use of military topographic and special use maps to include intersection, resection, modified resection, and polar coordinates. Development of overlays for tactical operations. Lab includes actual land navigation in the field using the electronic compass.

301. **Command and Control Communications**  
Fall. 3(2-2) M S 303 or approval of department.  
Tactical wire and radio communications systems and employment during tactical operations to provide effective control of military operations. Encryption/decryption, use of codes, and electronic warfare. Lab emphasizes practical application of communication skills.

302. **Military Leadership III**  
Winter. 3(2-3) M S 301 or approval of department.  
Application of the theories and models of the behavioral sciences to leadership as it functions in a military environment. Case studies from military history. Lab emphasizes practical leadership applications.

303. **Small Unit Tactics**  
(M S 325.) Spring. 3(2-3) M S 302 or approval of department.  
Offensive and defensive military tactics. Incorporates practical exercises which allow cadets to view the modern battlefield through the eyes of the infantry platoon leader. Lab emphasizes tactical employment of the infantry squad and platoon.

401. **Training Management and Unit Administration**  
(M S 426.) Fall. 3(2-2) M S 303 or approval of department.  
The Army training management system and the leader's role as a trainer. Operations and administration in military units to provide effective personnel management and logistic support. Oral and written military communication. Lab includes practical experience in unit administration.

402. **Military Leadership IV**  
(M S 401D.) Winter. 3(2-2) M S 401 or approval of department.  

403. **Military Law, Ethics, and Professionalism**  
(M S 427.) Spring. 3(2-2) M S 402 or approval of department.  
Military legal system and the responsibilities of leaders in the application of military justice. Examination of fundamental values and principles of conduct in the profession of arms. Lab includes practical exercises in professional development.

499. **Independent Study in Military Science**  
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department and Juniors.  
Individual research and study in an area related to military science as approved and directed by the Department of Military Science.

**MUSIC**

**MUS**

**College of Arts and Letters**

112. **Chamber Music**  
Fall, Winter, Spring, Summer. 1(1-0)  
May reenroll for a maximum of 18 credits. Approval of department.  
Performance of works for small ensembles.

118. **Band**

A. **Marching Band**  
Fall. 1 credit. May reenroll for credit. Membership determined by audition.  
The Marching Band participates at football games.

B. **Spartan Brass**  
Winter. 1 credit. May reenroll for credit. Membership determined by audition.  
The Spartan Brass participates at basketball games.

C. **Concert Band**  
Fall, Winter, Spring. 1 credit. May reenroll for credit. Membership determined by audition.  
Public appearances are scheduled on campus each term.

D. **Symphony Band**  
Fall, Winter, Spring. 1 credit. May reenroll for a maximum of 12 credits. Membership determined by audition. A high level of achievement in performing ability is required.  
Concerts are scheduled both on and off campus.

E. **Wind Symphony**  
Fall, Winter, Spring. 1 credit. May reenroll for a maximum of 12 credits. Membership determined by audition. The highest level of performance is required.  
Full range of wind literature is performed. Public concerts are presented both on and off campus.

F. **Campus Band**  
Fall, Winter, Spring. 1 credit. May reenroll for a maximum of 12 credits. Open to all MSU students in any academic discipline.  
Preparation for and participation in one concert.
13A. Symphony Orchestra
Fall, Winter, Spring. MUS 141. May reenroll for a maximum of 12 credits. Admission by audition.
Preparation and performance of symphony and operatic repertoire under direction of faculty and guest conductors of international reputation.

13B. Chamber Orchestra
Fall, Winter, Spring. MUS 141. May reenroll for a maximum of 12 credits. Membership determined by audition. A specialized ensemble of advanced performers concentrating on the repertoire of the classic composers, and modern repertoire for chamber orchestra. Rehearsals and performances with faculty and guest artists.

13C. Music in Elementary Education
Fall, Winter, Spring, Summer. MUS 141. Elementary education majors. Study of music learning strategies in the elementary schools. Music concepts and literature are developed through listening, performing, creative and analytical skills. Methods and materials are emphasized.

14A. Class Violin and Viola
MUS 141. Fall. 2(0-4) Knowledge of notation. Music majors or approval of school. Class instruction in violin and viola.

14B. Class Percussion 1
MUS 140. Fall. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in percussion.

14C. Class French Horn
MUS 140. Fall. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in French horn.

14D. Class Flute
MUS 140. Fall. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in flute.

14E. Class Oboe
MUS 140. Fall. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in oboe.

14F. Class Voice
MUS 141. Fall. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in voice.

14G. Class Piano
MUS 141. Fall, Winter. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in piano.

14H. Class Guitar
Fall, Winter. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in guitar.

14I. Class Cello and Stringed Bass
MUS 142. Winter. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in cello and stringed bass.

14J. Class Trumpet
MUS 142. Winter. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in trumpet.

14K. Class Trombone
MUS 140. Winter. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in trombone.

14L. Class Bassoon
MUS 140. Winter. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in bassoon.

14M. Class Voice
MUS 142. Winter. 10(2-2) MUS 141F. Continuation of MUS 141F.

14N. Class Piano
MUS 142. Winter, Spring. 1(0-2) MUS 141G. Continuation of MUS 141C.

14O. Class Guitar
Winter, Spring. 1(0-2) MUS 141J. Continuation of MUS 141J.

14P. Class Clarinet
MUS 143. Spring. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in clarinet.

14Q. Class Tuba and Euphonium
Spring. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in tuba and euphonium.

14R. Class Percussion II
Spring. 1(0-2) Continuation of MUS 141B.

14S. Class Saxophone
Spring. 1(0-2) Knowledge of notation. Music majors or approval of school. Class instruction in saxophone.

14T. Class Voice
MUS 143. Spring. 1(0-2) MUS 142F. Continuation of MUS 142 F.

14U. Class Piano
MUS 143. Spring. 1(0-2) MUS 142G. Continuation of MUS 142C.

14V. Class Guitar
Spring. 1(0-2) MUS 142J. Continuation of MUS 143J.

14W. Elementary Piano
Fall, Winter, Spring. 2(2-2) Elementary Education, Physical Education and Exercise Science, and Health Education and Human Performance majors or approval of school. Beginning class piano instruction. Development of ability to play the three principal chords in all keys and to harmonize simple melodies using these chords. Transposition of simple melodies. Ability to play melodies and rhythms suitable for use in lower intermediate grades or in recreation work.

14X. Elementary Piano
Winter, Spring. 2(2-2) MUS 147. Elementary Education majors. Continuation of MUS 147.

15A. Piano
MUS 150. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required. Private instruction in piano.

15B. Organ
MUS 150. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required. Private instruction in organ.

15C. Harp
MUS 150. Fall, Winter, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required. Private instruction in harp.

15D. Flute
MUS 152. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required. Private instruction in flute.

15E. Oboe
MUS 152. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required. Private instruction in oboe.

15F. Clarinet
MUS 153. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required. Private instruction in clarinet.

15G. Saxophone
MUS 153. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required. Private instruction in saxophone.

15H. Bassoon
MUS 153. Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required. Private instruction in bassoon.
154A. Trumpet  
(MUS 154.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required.  
Private instruction in trumpet.

154B. French Horn  
(MUS 154.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required.  
Private instruction in French horn.

154C. Trombone  
(MUS 154.) Fall, Winter, Spring, 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required.  
Private instruction in trombone.

154D. Euphonium  
(MUS 154.) Fall, Winter, Spring, 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required.  
Private instruction in euphonium.

154E. Tuba  
(MUS 154.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 18 credits. Audition required.  
Private instruction in tuba.

155. Percussion  
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

156. Basic Harmony  
Fall. 3(3-1)  
Fundamentals of basic musicanship: notation, clefs, scales, intervals, triads, root position, and tonality. The analysis and writing of diatonic harmony in the style of the Bach 4-part chorale.

157. Basic Harmony  
Winter. 3(3-1) MUS 180.  
Continuation of MUS 180.

158. Basic Harmony  
Spring. 3(3-1) MUS 181.  
Continuation of MUS 181.

159. Aural Harmony  
Fall. 1(0-0) MUS 180 concurrently.  
The aural counterpart of basic harmony. Drill in harmonic, melodic and rhythmic dictation. Sight singing and keyboard harmony.

160. Aural Harmony  
Winter. 1(0-2) MUS 183; MUS 181 concurrently.

161. Aural Harmony  
Spring. 1(0-2) MUS 184; MUS 182 concurrently.

162. Collegiate Choir  
Fall, Winter, Spring, 1(0-2) May reenroll for a maximum of 12 credits. Membership determined by audition.  
Three hours of choral rehearsals each week. Representative literature for mixed choir with emphasis on Renaissance, Baroque, Classical, Romantic, and contemporary composers. Attendance at all rehearsals and performances obligatory.

163. Introduction to Music Literature I (A)  
Fall. 4(4-0)  
Comparative study of selected musical works in historical context with emphasis on their relationships to society in general and the other arts in particular. From Antiquity through the Renaissance.

164. Advanced Class Piano  
Fall. 1(0-2) MUS 143G or approval of school. For Vocal-General Music Education majors only.  
Continuation of Class Piano MUS 143G. Special emphasis given to developing practical skills at the piano for use in the public school classroom.

165. Advanced Class Piano  
Spring. 1(0-2) MUS 242 or approval of school.  
Continuation of MUS 241.

166. Advanced Class Piano  
Winter. 1(0-2) MUS 241 or approval of school.  
Continuation of MUS 241.
245. *Music in Special Education*
Fall, Winter, Spring, Summer, 3(3-0)
MUS 135. Special education majors.
Methods of teaching music in special education programs.

250. *Introduction to Music Education*
Fall, Spring, 2(2-1) Sophomores in
Music Education or approval of department.
An overview of the field of school music. Study and discussion of historical background, current trends, and teaching responsibilities at all curricular levels.

251. *German Diction for Singers*
Fall, 1(1-1) Three terms of MUS 151.
Practice and training in German lyric diction. Rules of pronunciation; emphasis on spoken drill and performance of German art songs in class.

275. *Popular Music Styles*
Winter, 3(3-0)
Style characteristics of prominent genres of popular music in the twentieth century. The evolution of popular musical taste.

276. *Popular Music Styles*
Spring, 3(3-0)
A survey of style characteristics of prominent genres of popular music in the United States from 1930 to the present.

280. *Advanced Harmony*
Fall, 3(3-1) MUS 182.
Continuation of MUS 182, with added vocabulary and technique through nineteenth century harmony. Creative writing in small forms.

281. *Advanced Harmony*
Winter, 3(3-1) MUS 280.
Continuation of MUS 280.

282. *Advanced Harmony*
Spring, 3(3-1) MUS 281.
Continuation of MUS 281.

283. *Advanced Aural Harmony*
Fall, 1(0-2) MUS 185; MUS 280 concurrently.
Aural counterpart of advanced harmony. Drill in harmonic, melodic, and rhythmic dictation. Sight singing and keyboard harmony.

284. *Advanced Aural Harmony*
Winter, 1(0-2) MUS 283; MUS 281 concurrently.

285. *Advanced Aural Harmony*
Spring, 1(0-2) MUS 384; MUS 282 concurrently.

308. *Advanced Keyboard Tuning: Theory and Practice I*
Fall, 3(2-2) MUS 210 or approval of department.

309. *Advanced Keyboard Tuning: Theory and Practice II*
Winter, 3(2-2) MUS 389.
Continuation of MUS 308.

310. *Advanced Keyboard Tuning: Theory and Practice III*
Spring, 3(2-2) MUS 399.
Continuation of MUS 309.

320. *Music Workshop*
Summer, 1 to 6 credits. May be reenrolled for a maximum of 12 credits. Approval of department.

328. *Composing and Arranging for Jazz Ensemble I*
(MUS 334) Fall, 3(3-0) MUS 182; approval of school.
Techniques of orchestration, chord progressions, voicings, forms, and part/score writing for contemporary jazz ensemble. Analysis of recordings and scores.

329. *Composing and Arranging for Jazz Ensemble II*
Winter, 3(3-0) May be reenrolled for a maximum of 6 credits. MUS 328 or approval of school.
Techniques of composition for large jazz ensemble.

330. *Jazz in America I*
Spring, 3(3-0) Juniors or approval of department.
Jazz fundamentals, history, styles, and social significance.

331. *Advanced Jazz Improvisation I*
Fall, 2(2-0) MUS 233 or approval of school.
Continuation of MUS 233. Emphasis on continued proficiency of jazz skills. Introduction of pentatonic scale resources for all chord types.

332. *Advanced Jazz Improvisation II*
Winter, 2(2-0) MUS 331 or approval of school.
Continuation of MUS 331. Emphasis on continued proficiency of pentatonic scales, introduction of several new scale sources and patterns. Piano chord voicings.

333. *Advanced Jazz Improvisation III*
Spring, 2(2-0) MUS 332 or approval of school.
Continuation of MUS 332. Emphasis on chromatic motive development and nontraditional improvisation, i.e. solo improvisation, atonal improvisation, and unusual instrument combinations.

335. *Ensemble and Conducting*
Fall, Spring, 3(1-4) MUS 185 or approval of department.
Principles of conducting correlated with application in ensemble of vocal and instrumental class instruction. Survey of vocal and instrumental ensemble literature suitable for school use. Individual conducting stressed.

336. *Ensemble and Conducting*
Winter, 3(2-4) MUS 335.
Continuation of MUS 335.

345. *Teaching Music in the Elementary School I*
Fall, Winter, Spring, Summer, 3(3-0)
Approval of department.
Procedures and program of music instruction in the elementary school. Special emphasis on instructional problems of early elementary children.

347. *Methods and Literature*
Fall, Summer of odd-numbered years, 2(1-2) Six terms of study on applied instrument or voice, or approval of department.
Methods of teaching voice or instruments. Study of appropriate teaching literature.

348. *Methods and Literature*
Winter, 2(1-2) Six terms of study on applied instrument or voice, or approval of department.
Methods of teaching voice or instruments. Study of appropriate literature.

349. *Methods and Literature*
Spring, Summer of even-numbered years, 2(1-2) Six terms of study on applied instrument or voice, or approval of department.
Methods of teaching voice or instruments. Study of appropriate teaching literature.

350A. *Piano*
(MUS 330) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 24 credits. Six terms of MUS 150A or approval of school.
Private instruction in piano.

350B. *Organ*
(MUS 350) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 24 credits. Six terms of MUS 150B or approval of school.
Private instruction in organ.

350C. *Harp*
(MUS 350) Fall, Winter, Spring, 1 to 4 credits. May be reenrolled for a maximum of 24 credits. Six terms of MUS 150C or approval of school.
Private instruction in harp.

351. *Voice*
Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 24 credits. Six terms of MUS 150I or approval of department.
Continuation of MUS 151.

352A. *Violin*
(MUS 352) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 21 credits. Six terms of MUS 152A or approval of school.
Private instruction in violin.

352B. *Viola*
(MUS 352) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 21 credits. Six terms of MUS 152B or approval of school.
Private instruction in viola.

352C. *Cello*
(MUS 352) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 21 credits. Six terms of MUS 152C or approval of school.
Private instruction in cello.

352D. *Stringed Bass*
(MUS 352) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 24 credits. Six terms of MUS 152D or approval of school.
Private instruction in stringed bass.

352E. *Guitar*
Fall, Winter, Spring, 1 to 4 credits. May be reenrolled for a maximum of 21 credits. Six terms of MUS 152E or approval of school.
Private instruction in guitar.

353A. *Flute*
(MUS 353) Fall, Winter, Spring, Summer, 1 to 4 credits. May be reenrolled for a maximum of 21 credits. Six terms of MUS 153A or approval of school.
Private instruction in flute.
Descriptions — Music of Courses

353B. Oboe
(MUS 353.) Fall, Winter, Spring. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 353B or approval of school. Private instruction in oboe.

353C. Clarinet
(MUS 353.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 353C or approval of school. Private instruction in clarinet.

353D. Saxophone
(MUS 353.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 353D or approval of school. Private instruction in saxophone.

353E. Bassoon
(MUS 353.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 353E or approval of school. Private instruction in bassoon.

354A. Trumpet
(MUS 354.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 354A or approval of school. Private instruction in trumpet.

354B. French Horn
(MUS 354.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 354B or approval of school. Private instruction in french horn.

354D. Euphonium
(MUS 354.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 354D or approval of school. Private instruction in euphonium.

354E. Tuba
(MUS 354.) Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 21 credits. Six terms of MUS 354E or approval of school. Private instruction in tuba.

355. Percussion
Fall, Winter, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits. Six terms of MUS 155 or approval of department. Continuation of MUS 155.

361. Studies in Style and Form
Winter, Summer. 2(2-1) MUS 282. Analysis and creative writing of technical and structural practices in music of various periods, with special emphasis on the twentieth century.

362. Studies in Style and Form
Spring, Summer. 2(2-1) MUS 282. Analysis and creative writing of technical and structural practices in music of various periods, with special emphasis on the twentieth century.

363. Orchestration
Fall, Summer. 2(2-0) MUS 282. Modern orchestral resources and scoring for various instrumental groups.

365. Orchestration
Spring, Summer. 2(2-0) MUS 383. Continuation of MUS 383.

366. Counterpoint
Fall of even-numbered years. 2(2-0) MUS 382. Creative and analytical work with two-part counterpoint in the style of J. S. Bach.

367. Counterpoint
Winter of odd-numbered years. 2(2-0) MUS 386. Creative and analytical work with three-part counterpoint in the style of J. S. Bach.

401. Clinical Training in Music Therapy
Fall, Winter, Spring, Summer. 1 to 18 credits. Music therapy majors. Six months internship in an accredited neuropsychiatric hospital.

400H. Honors Work
Fall, Winter, Spring, Summer. 1 to 16 credits. May reenroll for a maximum of 16 credits. Approval of department.

408. Piano Technology I
Fall. 3(2-2) MUS 310 or approval of department. Method of and practice in restoring the original tone of old pianos. Replacing or replacing all worn parts. Advanced concert tuning and tone regulation.

409. Piano Technology II
Winter. 3(2-2) MUS 408. Continuation of MUS 408.

410. Piano Technology III
Spring. 3(2-2) MUS 409. Continuation of MUS 409.

411. Opera
Winter of odd-numbered years. 2(1-2) MUS 326. Six terms of voice or approval of department. History of opera from 1600 to the present.

412. Oratorio
Fall of even-numbered years. Summer. 2(1-2) Six terms of voice or approval of department. History of oratorio from 1600 to the present.

415A. Renaissance Music
Fall, 2 credits. MUS 182 or approval of department.

415B. 19th Century Music
Fall, 2 credits. MUS 182 or approval of department.

415C. Keyboard Music, Seventeenth through Eighteenth Centuries
Fall of even-numbered years. 2 credits. MUS 182 or approval of department.

415E. German Lieder
Fall of odd-numbered years. 2 credits. MUS 182 or approval of department.

415F. Organ Literature to 1700
Fall of odd-numbered years. 2 credits. MUS 182 or approval of department.

416A. Baroque Music
Winter. 2 credits. MUS 182 or approval of department.

416B. Twentieth Century Music, European
Winter. 2 credits. MUS 182 or approval of department.

416C. Piano Music, Nineteenth Century
Winter of odd-numbered years. 2 credits. MUS 182 or approval of department.

416E. French-Italian Art Song
Winter of even-numbered years. 2 credits. MUS 182 or approval of department.

417A. Classical Music
Spring. 2 credits. MUS 182 or approval of department.

417B. American Music
Spring. 2 credits. MUS 182 or approval of department.

417C. Piano Music, Twentieth Century
Spring of odd-numbered years. 2 credits. MUS 182 or approval of department.

417E. English-American Art Song
Spring of even-numbered years. 2 credits. MUS 182 or approval of department.

417F. Organ Literature From 1600 to Present
Spring of even-numbered years. 2 credits. MUS 182 or approval of department.

421. Music and Worship
Fall. 3(3-0) MUS 326 or approval of department. Relationship of music and liturgy to Christian worship. Traditional liturgies and forms of service of the Christian churches with emphasis on function and place of music in worship.
430. **Marching Band Methods and Materials**  
Winter. 2(2-0) Music Education Juniors or approval of instructor.  
Basic marching techniques, show development, charting techniques, use of accessory groups, and appropriate materials for high school marching band.

431. **Computers in School Music**  
Spring. 2(2-0) Music Education Juniors.  
Techniques and principles of computer-assisted instruction of music in school programs. Emphasis on appropriate hardware and software for teaching management.

434. **Aesthetic Theory and Modernism**  
Fall. 4(4-0) Juniors. Interdepartmental with History of Art, Linguistics and Oriental and African Languages, Romance Languages, and the departments of English and Philosophy.  
Administrative approval of Philosophy. Problems, assumptions, and arguments of modern aesthetic theory examined in the context of debates over modernity and modernist artistic practice.

435. **Advanced Conducting**  
Spring. 2(2-0) Approval of department.  
Development of conducting skills through rehearsals and analysis of literature appropriate for secondary school performing ensembles.

438. **Brass and Woodwind Techniques**  
Spring. 2(1-2) Senior music majors.  
Materials and contemporary pedagogical practice of group wind instrumental instruction.

439. **Electronic and Computer Music Literature**  
Fall, Summer. 2(2-0) MUS 282 or approval of school.  
Music literature composed with tape recorders, synthesizers, and computers, 1950 to present.

440. **Introduction to Electronic Music Composition**  
Fall, Summer. 2(2-0) MUS 282 or approval of school.  
Audio recording and processing techniques; tape manipulation techniques; signal generating and processing modules of analog, voltage-controlled synthesis, compositional techniques of musique concrete and electronic synthesis.

441. **Introduction to Computer Music Composition**  
Spring, Summer. 2(2-0) MUS 282 or approval of school.  
Digital synthesizers, MIDI; computer sequencing and librarian techniques; compositional and computational techniques of computer music.

442. **Independent Projects in Electronic and Computer Music Composition**  
Fall, Winter, Spring. Summer. 2 credits. May reenroll for a maximum of 6 credits.  
MUS 411 or approval of school.  
Independent compositional work and assigned use of the Electronic and Computer Music Studio.

450. **Recreational Music**  
Spring. Summer of odd-numbered years. 2(2-0) Majors.  
Organization and administration of a community music program for adults, community choirs, orchestra, and band. Nonsymphonic instruments and their use in recreation. Summer camp and playground music. Recreational music as it is organized and used by industries.

462. **Studio Teaching and Observation**  
Fall, Winter. 2(1-2) MUS 347, MUS 348, MUS 349.  
Supervised studio teaching in classes and private lessons plus on-hour seminar each week.

463. **Studio Teaching and Observation**  
Winter. 2(2-0) MUS 462.  
Continuation of MUS 462.

464. **Studio Teaching and Observation**  
Spring. 2(1-2) MUS 463.  
Continuation of MUS 463.

470. **Influence of Music on Behavior**  
Fall. 3(3-0) Nine credits of psychology or approval of department.  
Study of the physiological and psychological effects of music; relation of music to health, Experimental studies, related psychological and sociological theory will be reviewed.

471. **Music Therapy Techniques**  
Winter. 3(3-0) MUS 470.  
Survey of procedures in music therapy; investigation of the rise of music as a tool in treatment of mentally ill, mentally and physically handicapped; introduction to hospital organization.

472. **Music Therapy Techniques**  
Spring. 3(3-0) MUS 471.  
Continuation of MUS 471.

473. **Composition**  
Fall, Winter, Spring, Summer. 2(2-0) May reenroll for a maximum of 6 credits. MUS 282 or approval of department.  
Guided projects in creative writing.

486. **Psychology of Music**  
Fall, Summer. 3(3-0) Approval of department.  
Interdepartmental with and administered by the Department of Psychology.  
Musical behavior with emphasis on psychological aspects of perception, learning, affective response, and ability. Emphasis on social and cultural influences in forming musical tastes, including mass media music.

487. **Psychology of Music**  
Summer, Winter. 3(2-2) PSY 486 or approval of department.  
Interdepartmental with and administered by the Department of Psychology.  
Basic research concepts and experimental methods in psychology of music research. Practical training in conducting experimental research of musical behavior.

490. **Independent Study: Special Problems in Music Research**  
Fall, Winter, Spring. Summer. 1 to 4 credits. May reenroll for credit. Seniors and approval of department.  
Individual problems in music research.

495. **Opera Workshop**  
Fall, Winter, Spring. 1 to 2 credits. May reenroll for a maximum of 6 credits. Approval of department.  
Practical experience in performance and production of opera and opera scenes.

499. **Special Topics**  
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 10 credits if a different topic is taken. Juniors, or approval of department.  
Offered on an experimental basis according to instructor availability and student interest.

502. **Seminar in History of Music**  
Summer. 4(5-0) May reenroll for a maximum of 12 credits. Approval of department.  
Critical study in depth of music literature and performance practices within historical perspective.

503. **Seminar in Music Education**  
Spring of odd-numbered years. Summer of even-numbered years. 3(3-0) Approval of department.  
Consideration of the historical and philosophical basis for music instruction in education.

504. **Seminar in Music Learning**  
Fall, Summer. 3(3-0) Approval of department.  
Detailed analysis of the conditions of music learning for teachers of music including consideration of perception, maturation and concept formation.

505. **Seminar in Music Curriculum**  
Winter, Summer. 3(3-0) Approval of department.  
Development of goals, objectives, learning sequence and evaluative techniques for music learning at all instructional levels.

506. **Seminar in Music Education Methodology**  
Spring of odd-numbered years. Summer of even-numbered years. 3(3-0) Approval of department.  
Critical analysis of various methodologies in music teaching. Emphasis on the impact of methods and their applications to improvement of musical growth in performance, cognitive, and affective domains.

511. **Introduction to Research in Music Education and Music Therapy**  
Fall, Summer. 3(3-0) Approval of department.  
Conducting and critically interpreting research in music education and music therapy. Library skills, experimental research, and statistical analysis are emphasized.

512. **Research Problems in Music**  
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 15 credits.

513. **Chamber Music**  
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 6 credits. Approval of department.  
Performance of works for small ensembles.

515. **Seminar in Chamber Music: 18th Century**  
Winter of even-numbered years. 2(2-0) Approval of department.  
Intensive study of selected chamber music works of the 18th century.

516. **Seminar in Chamber Music: 19th Century**  
Winter of odd-numbered years. 2(2-0) Approval of department.  
Intensive study of selected chamber music works of the 19th century.

517. **Seminar in Chamber Music: 20th Century**  
Spring. 2(2-0) Approval of department.  
Intensive study of selected chamber music works of the 20th century.
820. Music Workshop
Fall, Winter, Summer. 1 to 9 credits. May reenroll for a maximum of 9 credits. Approval of department.

821. Advanced Methods and Materials in Elementary Music
Fall, Winter, Spring, Summer. 3(3-0)
May reenroll for a maximum of 12 credits. Teaching methods and materials for special topics in elementary music, such as music literature, Orff, Kodaly, and integrated arts.

824. Research Methods and Materials
Fall. 3 or 4 credits.
A critical examination of encyclopedias, indices, and other aids to research, and of the organization, presentation and documentation of research results.

830. Sixteenth Century Counterpoint
Fall of even-numbered years, Summer. 3(3-0) MUS 483 or approval of department.
Study and writing of counterpoint based upon the works of Orlando Lasso and Palestrina.

831. Sixteenth Century Counterpoint
Winter of odd-numbered years, Summer. 3(3-0) MUS 680.
Continuation of MUS 830.

834. Seminar in Composition
Fall, Winter, Spring, Summer. 2(2-0)
May reenroll for a maximum of 24 credits. Study of contemporary music with emphasis on compositional procedures.

843. Pedagogy of Theory
Fall, Winter, Spring, Summer. 3(3-0) Approval of department.
Methods, content, and textbooks for teaching basic theory.

845. Pedagogy of Theory
Winter, Summer. 3(3-0) Approval of department.
Continuation of MUS 843 with emphasis upon new instructional media, and upon methods and materials in ear training and sight singing.

846. Minor Instrument Study: String
Fall, Winter, Spring, Summer. 1(1-0)
May reenroll for a maximum of 12 credits. Secondary instrument for students enrolled in string specialist program.

847. Minor Instrument Study: Brass
Fall, Winter, Spring, Summer. 1(1-0)
May reenroll for a maximum of 12 credits. Secondary instrument for students enrolled in brass specialist program.

848. Minor Instrument Study: Woodwinds
Fall, Winter, Spring, Summer. 1(1-0)
May reenroll for a maximum of 12 credits. Secondary instrument for students enrolled in woodwind specialist program.

849. Minor Instrument Study: Piano
Fall, Winter, Spring, Summer. 1(1-0)
May reenroll for a maximum of 12 credits. Study of piano for students in majors other than applied music.

850. Applied Music
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 27 credits.

851. Minor Instrument Study: Voice
Fall, Winter, Spring, Summer. 1(1-0)
May reenroll for a maximum of 12 credits. Study of vocal techniques for students in majors other than applied music.

852. Choral Technique and Materials
Spring, Summer. 3(3-0) May reenroll for a maximum of 9 credits. Completion of undergraduate program in music education.
Advanced course for further development of choral proficiency. Demonstrations of choral techniques, conducting by students, examination and evaluation of new materials.

856. Problems in Analysis
Summer. 4(4-0) May reenroll for a maximum of 8 credits. Completion of undergraduate program in music education.
An application of analytical procedures to school music repertoire.

870. Composition with Computers
Winter. 2(2-0) MUS 834 or approval of school.
Techniques and principles of composition with computers. Use of computer equipment and software.

871. Computer Music Projects
Spring. 1 to 3 credits. May reenroll for a maximum of 12 credits. MUS 870, MUS 894, or approval of school.
Music theory and composition projects using computer equipment and software.

875. Computer Aided Instruction in Music Theory
Spring. 2(2-0) MUS 84 or approval of school.
Problems of design, implementation, and evaluation of college-level computer-aided instruction software in music theory.

880. Materials of Music
Fall, Winter, Summer. 1 to 4 credits. MUS 282.
Correlation of the areas of music theory as a basis for the study of 19th and 20th century music.

881. Materials of Music
Winter, Spring. 1 to 4 credits. MUS 880.
Continuation of MUS 880.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.
122. Human Biocultural Evolution (N)  
Fall, Winter, Spring. 4(3-2)  
Current understanding of human beings and their beliefs as products of biological and cultural evolution. Implications for the future of humanity.

125. Time and Change in Nature (N)  
Fall, Winter, Spring, Summer. 4(3-2)  
A—Our attempts to explain the present in terms of past events are explored through selected topics from the life sciences and earth sciences. Stress the role of controversy in science and the nature of scientific evidence.  
B—Heredity, evolution and diversity of life are examined from the biological and cultural development of the human species.  
C—The origin and evolution of earth and living things are studied as vital and related problems. Emphasis on problem-solving in science and impact of evolutionary concepts on human societies.

129. Biotechnology and Human Values (N)  
Winter, Spring. 4(4-0)  
Consideration of social and ethical issues which arise from our increasing control of the human body through biotechnology.

135. Changing Concepts of the Universe (N)  
Fall, Winter, Spring. 4(3-2)  
Students may not receive credit in more than one of the following: AST 119, AST 217, AST 229, N S 135, N S 136 or N S 1834.  
A—The origin and development of scientific explanations of the physical world. The origins of modern science and scientific revolutions.  
B—The role of science in the development of western ideas about reality. The origin and development of mechanistic concepts of the physical world and their part in intellectual dialogue.  

142. Life, Its Environment (N)  
Fall, Winter, Spring. 4(3-2)  
Natural ecological systems and the impact of human biological and cultural development on them. Examination of specific ecological problems and the role of science in seeking solutions.

152. Science and Culture in the 20th Century (N)  
Fall, Winter, Spring. 4(4-0)  
Controversies concerning interpretation of modern scientific concepts such as evolution, uncertainty and relativity are discussed in terms of developing a personal philosophy.

162. Race, The Evolution of an Idea (N)  
Fall, Winter, Spring. 4(3-2)  
N S 115 or approval of department.  
Human races and evolution. The biological concept of race based on the theories of the gene, evolution, and natural selection.