

**MICROBIOLOGY AND PUBLIC HEALTH**

**892\* Seminar**  
 Fall, Spring. 1(1-0) May reenroll for a maximum of 6 credits.  
 R: Graduate students

QA: 800

**899\* Master's Thesis Research**  
 Fall, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 24 credits.  
 R: graduate students

QA: MPH 899

**991\* Current Topics in Microbiology**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
 R: graduate students

Topics are selected from taxonomic subsciences such as bacteriology, virology, cell biology, immunology and from from transecting subdisciplines such as genetics, physiology, molecular biology and ecology.  
 QA: MPH 900

**999\* Doctoral Dissertation Research**  
 Fall, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 36 credits.  
 R: graduate students

QA: MPH 999

**MILITARY SCIENCE MS**

**101. Leadership: The Military Profession**  
 Fall, Spring, Summer. 1(1-1)

Analysis of military profession from several academic perspectives. Technical, ethical, and personal ramifications of officership. Introduction to military leadership. Lab introduces military skills.  
 QA: MS101 MS102

**102. Leadership: Land Navigation**  
 Fall, Spring. 1(1-1)

Military topographic and special maps: intersection, resection, modified resection, and polar coordinates. Tactical operation overlays. Preview of small unit leader's role in the Army. Lab: use of lensatic compass.  
 QA: MS102 MS203

**201. Leadership Assessment Program, the Military Leader**  
 Fall, Spring, Summer. 1(1-1)

Individual leadership development using standardized assessment technology. Administration, personal relations, and decision making. Military writing and professional obligations. Lab includes rappelling and marksmanship.  
 QP: MS103 QA: MS201 MS202

**202. Leadership: First Aid/Fitness Training**  
 Fall, Spring, Summer. 1(1-1)

Emergency first aid including casualty evaluation, lifesaving measures, CPR, and environmental injury prevention. Leader's role in implementing Army Physical Fitness Program. Individual and group fitness programs. Lab: hands on leadership training.  
 QP: MS201 QA: MS103 MS201

**301. Leadership: Command and Control Communication**  
 Fall, Spring, Summer. 3(2-3)  
 P: MS 202.

Wire and radio communications for tactical operations. Encryption/decryption, use of codes, and electronic warfare. Theories and models of behavioral sciences for leadership. Lab emphasizes communication skills.  
 QP: MS 202 QA: MS301 MS302

**302. Leadership: Small Unit Tactics**  
 Fall, Spring, Summer. 3(2-2)  
 P: MS 301.

Military topographic and special maps: intersection, resection, modified resection, and polar coordinates. Tactical operation overlays. Preview of small unit leader's role in the Army. Lab: use of lensatic compass.  
 QP: MS301 QA: MS302 MS303

**401. Leadership: Management**  
 Fall, Spring, Summer. 3(2-3)  
 P: MS 302.

Army training personnel administration and logistics systems, and the leader's role as a trainer and effective manager. Oral and written communication. Leadership assessment and development. Lab: practical experience in unit administration.  
 QP: MS302 QA: MS401 MS402

**402. Military Law, Ethics and Professionalism**  
 Spring, Summer. 3(2-3)  
 P: MS 401.

Military legal system. Application of military justice. Fundamental values and principles of conduct in the profession of arms. Development of subordinates and the role of noncommissioned officers. Lab includes leadership development assessment.  
 QP: MS401 QA: MS402 MS403

**490. Independent Study in Military Science**  
 Fall, Spring, Summer. 1 to 4 credits.  
 R: Open only to juniors and seniors.

Approval of department.  
 Individual research in areas related to military science.  
 QA: MS499

**MUSIC MUS**

**112\*. Chamber Music**  
 Fall, Spring. 1(0-2) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of broad range of chamber music literature.  
 QA: MUS 112

**114\*. Marching Band**  
 Fall. 1(0-9) May reenroll for a maximum of 6 credits.  
 R: Audition required.

Rehearsal and performance of broad range of marching band literature at football games.  
 QA: MUS 118A

**115\*. Spartan Brass**  
 Spring. 1(0-2) May reenroll for a maximum of 6 credits.  
 R: Audition required.

Rehearsal and performance of broad range of brass literature at basketball and hockey games.  
 QA: MUS 118B

**116. Campus Band**  
 Fall, Spring. 1(0-3) May reenroll for a maximum of 10 credits.

Rehearsal and performance of broad range of band literature chosen from baroque period to the present.  
 QA: MUS 118F

**117\*. Concert Band**  
 Fall, Spring. 1(0-3) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of broad range of wind literature from various historical periods and styles.  
 QA: MUS 118C

**118\*. Wind Symphony**  
 Fall, Spring. 1(0-5) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of broad range of wind literature from various periods and styles.  
 QA: MUS 118E

**120\*. Symphony Orchestra**  
 Fall, Spring. 1(0-5) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of symphonic and operatic repertoire.  
 QA: MUS 133A

**121\*. Chamber Orchestra**  
 Fall, Spring. 1(0-4) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of representative chamber works of baroque, classic and contemporary composers.  
 QA: MUS 133B

**123\*. Collegiate Choir**  
 Fall, Spring. 1(0-3) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of representative literature for mixed choir with emphasis on renaissance, baroque, classical, romantic, and contemporary composers.  
 QA: MUS 189

**124\*. Choral Union**  
 Fall, Spring. 1(0-2) May reenroll for a maximum of 10 credits.  
 R: Audition required.

University and community chorus. One evening rehearsal per week, culminating in performance of a major work with orchestra.  
 QA: MUS 191

**125. Glee Club, Men and Women**  
 Fall, Spring. 1(0-3) May reenroll for a maximum of 10 credits.

Rehearsal and performance of broad range of choral literature chosen from medieval period to the present.  
 QA: MUS 192

**126\*. State Singers**  
 Fall, Spring. 1(0-4) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Mixed choir performing music from all periods.  
 QA: MUS 190

**127\*. University Chorale**  
 Fall, Spring. 1(0-4) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Mixed chamber choir for experienced singers performing representative literature from all periods.  
 QA: MUS 193

**129\*. Percussion Ensemble**  
 Fall, Spring. 1(0-3) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance of representative works for percussion and mallet ensembles.  
 QA: MUS 112

**130\*. Jazz Band**  
 Fall, Spring. 1(0-4) May reenroll for a maximum of 10 credits.  
 R: Audition required.

Rehearsal and performance in large jazz ensemble. Literature from classic bands of Ellington and Basie to contemporary composers.  
 QA: MUS 195

## MUSIC

- 131\*.** **Jazz Combo**  
Fall, Spring. 1(1-2) May reenroll for a maximum of 10 credits.  
R: Audition required.  
Rehearsal and performance in small jazz ensembles. Literature from all historical periods of jazz.  
QA: MUS 196
- 135\*.** **Music in Elementary Education**  
Fall, Spring. 3(2-2)  
R: ALL ELEMENTARY EDUCATION AND CHILD DEVELOPMENT MAJORS  
A study of the aural elements of music. How elementary pupils and classroom teachers perceive, sort, and classify musical sounds as encountered in selected genre and styles of musical art.  
QP: MUS 135
- 141\*.** **Class Instruction in Piano I**  
Fall, Spring. 1(1-1)  
R: Open only to students in School of Music.  
Use of the piano as a teaching tool.  
QP: NOTATION QA: MUS 142G
- 142\*.** **Class Instruction in Piano II**  
Spring. 1(1-1)  
P: MUS 141. R: Open only to students in School of Music.  
Use of the piano as a teaching tool.  
QP: MUS 141G QA: MUS 142G MUS 143G
- 143\*.** **Class Instruction in Voice I: Music Majors**  
Fall. 1(1-1)  
C: MUS 151 R: Open only to students in School of Music with an emphasis in voice.  
English lyric diction. Rules of pronunciation. Performance of English language songs in class.  
QA: MUS 141F
- 144\*.** **Class Instruction in Voice II: Music Majors**  
Spring. 1(1-1)  
P: MUS 143. C: MUS 151 R: Open only to students in School of Music with an emphasis in voice.  
Italian lyric diction. Rules of pronunciation. Performance of Italian language songs in class.  
QP: MUS 141F QA: MUS 142F MUS 143F
- 145\*.** **Class Instruction in Voice I**  
Fall. 1(1-1)  
R: Not open to students in School of Music with an emphasis in voice.  
Rules of pronunciation. Vocal techniques.  
QA: MUS 141F
- 146\*.** **Class Instruction in Voice II**  
Spring. 1(1-1)  
P: MUS 145. R: Not open to students in School of Music with an emphasis in voice.  
Vocal techniques and exploration of vocal literature.  
QP: MUS 141F QA: MUS 142F MUS 143F
- 147\*.** **Class Instruction in Elementary Piano I**  
Fall, Spring. 2(2-1)  
R: Not open to students in School of Music.  
Basic notation, performance, improvisation, and transposition. Repertoire includes folksongs, simple classics, and blues.  
QA: MUS 147
- 148\*.** **Class Instruction in Elementary Piano II**  
Fall, Spring. 2(2-1)  
P: MUS 147. R: Not open to students in School of Music.  
Note reading and performance, folksongs, easy ragtime, jazz, and shorter classics.  
QP: MUS 147 QA: MUS 148
- 149\*.** **Keyboard Skills**  
Fall, Spring. 1(0-2) May reenroll for a maximum of 4 credits.  
R: Open only to students in School of Music.  
Sight-reading, transposing, figured bass, keyboard harmony, and accompanying instrumentalists and vocalists.  
QA: MUS 356
- 150A\*.** **Piano**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
R: Open only to students in School of Music. Audition required.  
Private instruction in piano.  
QA: MUS 150A
- 150B\*.** **Pipe Organ**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Open only to students in School of Music. Audition required.  
Private instruction in pipe organ.  
QA: MUS 150B
- 150C\*.** **Harp**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Open only to students in School of Music. Audition required.  
Private instruction in harp.  
QA: MUS 150C
- 151\*.** **Voice**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 12 credits.  
R: Open only to students in School of Music and students in Music secondary teaching minor. Audition required.  
Private instruction in voice.  
QA: MUS 151
- 152A\*.** **Violin**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in violin.  
QA: MUS 152A
- 152B\*.** **Viola**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in viola.  
QA: MUS 152B
- 152C\*.** **Cello**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in cello.  
QA: MUS 152C
- 152D\*.** **Double Bass**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in double bass.  
QA: MUS 152D
- 153A\*.** **Flute**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in flute.  
QA: MUS 153A
- 153B\*.** **Oboe**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in oboe.  
QA: MUS 153B
- 153C\*.** **Clarinet**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in clarinet.  
QA: MUS 153C
- 153D\*.** **Saxophone**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in saxophone.  
QA: MUS 153D
- 153E\*.** **Bassoon**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in bassoon.  
QA: MUS 153E
- 154A\*.** **Trumpet**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in trumpet.  
QA: MUS 154A
- 154B\*.** **Horn**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in horn.  
QA: MUS 154B
- 154C\*.** **Trombone**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in trombone.  
QA: MUS 154C
- 154D\*.** **Euphonium**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in euphonium.  
QA: MUS 154D
- 154E\*.** **Tuba**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in tuba.  
QA: MUS 154E
- 155\*.** **Percussion Instruments**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 16 credits.  
R: Audition required.  
Private instruction in percussion instruments.  
QA: MUS 155
- 160\*.** **Class Instruction in Guitar**  
Fall. 1(1-0)  
R: Open only to students in Music Therapy and to other students in School of Music with a teacher certification option.  
Chording, strumming and finger picking techniques. Accompanying and song leading with guitar. Reading of notation and tablature. Classical and popular styles.  
QA: MUS 141J
- 161\*.** **Class Instruction in Stringed Instruments**  
Spring. 2(2-2)  
R: Open only to students in Music Therapy and to other students in School of Music with a teacher certification option.  
Techniques for playing and teaching stringed instruments.  
QA: MUS 141A MUS 142A

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- 162\*.** **Class Instruction in Flute and Saxophone**  
 Spring. 1(0-2)  
 R: Open only to students in School of Music with a teacher certification option.  
 Techniques for playing and teaching flute and saxophone.  
 QA: MUS 143D MUS 141D
- 163\*.** **Class Instruction in Clarinet**  
 Fall. 1(0-2)  
 R: Open only to students in School of Music with a teacher certification option.  
 Techniques for playing and teaching clarinet.  
 QA: MUS 143A
- 164\*.** **Class Instruction in Double Reed Instruments**  
 Spring. 1(0-2)  
 R: Open only to students in School of Music with a teacher certification option.  
 Techniques for playing and teaching oboe and bassoon.  
 QA: MUS 142D MUS 141E
- 165\*.** **Class Instruction in High Brass Instruments**  
 Fall. 1(0-2)  
 R: Open only to students in School of Music with a teacher certification option.  
 Techniques for playing and teaching trumpet and horn.  
 QA: MUS 141C MUS 142B
- 166\*.** **Class Instruction in Low Brass Instruments**  
 Spring. 1(0-2)  
 R: Open only to students in School of Music with a teacher certification option.  
 Techniques for playing and teaching trombone, euphonium, and tuba.  
 QA: MUS 142C MUS 143B
- 167\*.** **Class Instruction in Percussion Instruments**  
 Fall. 2(1-2)  
 R: Open only to students in Music Therapy and to other students in School of Music with a teacher certification option.  
 Techniques for playing and teaching percussion instruments.  
 QA: MUS 141B MUS 143C
- 180\*.** **Fundamentals of Music**  
 Fall. 2(2-1)  
 Conceptual and notational presentation of the basic components of musical structure. No previous familiarity with music is assumed.  
 QA: MUS 180
- 181\*.** **Musicianship I**  
 Spring. 3(3-1)  
 P: MUS 180.  
 Hierarchical musical structure through species counterpoint and figured bass. Linear and vertical aspects of tonality.  
 QP: MUS 180 QA: MUS 181 MUS 182
- 182\*.** **Ear Training and Sight Singing I**  
 Fall. 1(1-1)  
 Dictation, melody singing using solfege (movable do) syllables, intervals to octave, error detection, quarter note values in rhythm, part singing.  
 QA: MUS 183
- 183\*.** **Ear Training and Sight Singing II**  
 Spring. 1(1-1)  
 P: MUS 182.  
 Dictation, singing melodies in major and minor keys. Simple modulation, chromatic alteration, error detection, rhythms, triads and components, part singing.  
 QP: MUS 183 QA: MUS 184 MUS 185
- 208\*.** **Basic Keyboard Tuning: Theory and Practice I**  
 Fall. 2(2-2)  
 P: MUS 181, MUS 182 or concurrently.  
 R: Not open to freshmen.  
 Acoustics of intervals. Historical development of music scales and tuning systems. Classical and modern methods of keyboard tuning.  
 QP: MUS 185 QA: MUS 208
- 209\*.** **Basic Keyboard Tuning: Theory and Practice II**  
 Spring. 2(2-2)  
 P: MUS 208. R: Not open to freshmen.  
 Acoustics of intervals. Historical development of music scales and tuning systems. Classical and modern methods of keyboard tuning.  
 QP: MUS 208 QA: MUS 209 MUS 210
- 211\*.** **History of Western Music to 1750**  
 Fall. 3(3-0)  
 P: MUS 181. R: Not open to freshmen.  
 Open only to students in School of Music.  
 Music from ancient Greece through the Baroque. Literature and theory of plainsong, instrumental and vocal traditions, and vocal polyphony before 1750 in sociopolitical context.  
 QP: MUS 182 QA: MUS 224
- 212\*.** **History of Western Music Since 1750**  
 Spring. 3(3-0)  
 P: MUS 211. R: Not open to freshmen.  
 Open only to students in School of Music.  
 Literature of the cultivated tradition and its theory in sociopolitical context.  
 QP: MUS 224 QA: MUS 225 MUS 226
- 230\*.** **Beginning Jazz Improvisation I**  
 Fall. 2(2-0)  
 P: MUS 181. R: Not open to freshmen.  
 Keys, modes, chord progressions as improvisational tools. Blues form in basic keys. Aural transcription of recorded solos.  
 QP: MUS 182 QA: MUS 231
- 231\*.** **Beginning Jazz Improvisation II**  
 Spring. 2(2-0)  
 P: MUS 230. R: Not open to freshmen.  
 Performance of complete tunes using II, V-I progressions in all major and minor keys. Transcriptions of recorded jazz solos.  
 QP: MUS 231 QA: MUS 232
- 241\*.** **Advanced Class Instruction in Piano I**  
 Fall. 1(1-1)  
 P: MUS 142. R: Not open to freshmen.  
 Open only to students in School of Music with an emphasis in voice.  
 Use of the piano as a teaching tool in school music.  
 QP: MUS 143G QA: MUS 241
- 242\*.** **Advanced Class Instruction in Piano II**  
 Spring. 1(1-1)  
 P: MUS 241. R: Not open to freshmen.  
 Open only to students in School of Music with an emphasis in voice.  
 Use of the piano as a teaching tool in school music.  
 QP: MUS 241 QA: MUS 242
- 245\*.** **Music in Special Education**  
 Fall. 2(2-0)  
 P: CEP 460 R: Sophomore or above Education  
 Methods of using music experiences in the educational, social, emotional and physical development of students with special needs.  
 QP: MUS 135 QA: MUS 245
- 248\*.** **German Diction for Singers**  
 Fall. 1(1-1)  
 P: Music 151. R: Open only to students in School of Music.  
 German lyric diction. Rules of pronunciation. Performance of German art songs in class.  
 QP: MUS 151 QA: MUS 251
- 249\*.** **French Diction for Singers**  
 Spring. 1(1-1)  
 P: MUS 151. R: Open only to students in School of Music.  
 French lyric diction. Rules of pronunciation. Performance of French art songs in class.  
 QP: MUS 151 QA: MUS 252
- 260\*.** **Introduction to School Music**  
 Fall, Spring. 2(2-1)  
 R: Sophomores and above. Arts and Letters and College of Education. Music Education maj., secondary education maj. w/music minor  
 School music, study and discussion of historical foundations, current trends, and teaching responsibilities at all curricular levels.  
 QA: MUS 250
- 270\*.** **Music Therapy: Foundations and Principles**  
 Fall. 3(3-0)  
 R: Not open to freshmen.  
 History, philosophy and scope of the practice of music therapy. Use of music in treating people with special needs. Field trips required.
- 271\*.** **Music Therapy: Instrumental, Vocal and Movement Techniques**  
 Spring. 3(3-0)  
 P: MUS 270. R: Not open to freshmen.  
 Creative and expressive techniques involving percussion instruments, autoharp, handchimes, song leading, creative movement, folk dance.  
 QA: MUS 450
- 280\*.** **Musicianship II**  
 Fall. 3(3-1)  
 P: MUS 181.  
 Techniques of diatonic modulation and soprano harmonization. Chromatic techniques.  
 QP: MUS 182 QA: MUS 280
- 281\*.** **Musicianship III**  
 Spring. 3(3-1)  
 P: MUS 280.  
 Research base for formal categorization. Large-scale principles of musical organization. Chromatic substitution and chords derived from voice-leading.  
 QP: MUS 280 QA: MUS 281 MUS 282
- 282\*.** **Advanced Ear Training and Sight Singing I**  
 Fall. 1(1-1)  
 P: MUS 183.  
 Dictation including recognition of triads, functions, cadences, seventh-chord harmonies, chord components. Two- and four-part dictation and singing.  
 QP: MUS 185 QA: MUS 283
- 283\*.** **Advanced Ear Training and Sight Singing II**  
 Spring. 1(1-1)  
 P: MUS 282.  
 Recognition of harmonic functions in major keys, minor keys, and modulations. Dictation in two- and four-part textures including augmented-sixth chords and nonharmonic tones.  
 QP: MUS 283 QA: MUS 284 MUS 285
- 290\*.** **Independent Study**  
 Fall, Spring, Summer. 1 to 3 credits.  
 May reenroll for a maximum of 9 credits.  
 R: Approval of the School  
 Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

MUSIC

- 308\*.** **Advanced Keyboard Tuning: Theory and Practice I**  
Fall. 3(2-2)  
P: MUS 209. R: Not open to freshmen and sophomores.  
History of piano construction including physics of action and string measurements. Action regulation and minor repairs. Concert tuning and tone regulation.  
QP: MUS 210 QA: MUS 308
- 309\*.** **Advanced Keyboard Tuning: Theory and Practice II**  
Spring. 3(2-2)  
P: MUS 308. R: Not open to freshmen and sophomores.  
History of piano construction including physics of action and string measurements. Action regulation and minor repairs. Concert tuning and tone regulation.  
QP: MUS 308 QA: MUS 309 MUS 310
- 330\*.** **Advanced Jazz Improvisation I**  
Fall. 2(2-0)  
P: MUS 231. R: Not open to freshmen and sophomores.  
Secondary dominants, borrowed chords, and tritone substitutions. Transcription of recorded jazz solos.  
QP: MUS 233 QA: MUS 331
- 331\*.** **Advanced Jazz Improvisation II**  
Spring. 2(2-0)  
P: MUS 330. R: Not open to freshmen and sophomores.  
Pentatonic scale relationships within II-V-I progressions. Aleatoric approaches to improvisation. Non-traditional chord progressions. Transcription of recorded jazz solos.  
QP: MUS 331 QA: MUS 332 MUS 333
- 335\*.** **Ensemble Conducting I**  
Fall. 2(2-2)  
P: MUS 181 R: Not open to freshmen and sophomores Arts and Letters and College of Education Music, Secondary Education majors with Music minor, Theatre  
Introduction to conducting and rehearsal techniques.  
QA: MUS 335
- 336\*.** **Ensemble Conducting II**  
Spring. 2(2-2)  
P: MUS 335 R: Not open to freshmen and sophomores Arts and Letters and College of Education. Music Education maj., secondary ed. maj. w/ music min. Mus.Th.  
Advanced conducting and rehearsal techniques as applied to music literature from each of the stylistic periods.  
QP: MUS 335 QA: MUS 336
- 337\*.** **Conducting for Music Performance Majors**  
Fall, Spring. 1(1-1)  
R: Open only to Music Performance majors.  
Beat patterns, clefs, and transpositions of string, wind, and percussion instruments. Score reading and analysis. Rehearsal techniques.  
QA: MUS 436
- 339\*.** **Instructional Techniques and Management Skills for Teaching School Music**  
Spring. 3(2-2) Interdisciplinary with the Department(s) of Teacher Education.  
P: MUS 260 R: Junior level and above Music Education Music Education minors  
Techniques for developing instructional and management skills for teaching school music. Campus and off-campus clinical experiences are required.
- 340\*.** **Methods and Literature for Voice**  
Fall. 3(3-0)  
P: Four semesters of MUS 151. R: Open only to majors in School of Music.  
Methods of teaching voice. Literature for both private lessons and classrooms.  
QP: MUS 151 QA: MUS 347 MUS 348
- 341\*.** **String Pedagogy**  
Spring. 2(2-1)  
R: Open only to majors in School of Music.  
Principles, techniques, and materials for teaching stringed instruments.  
QA: MUS 349
- 346\*.** **Keyboard Methods and Literature I**  
Fall. 2(2-0)  
P: Four semesters of MUS 150A. R: Open only to majors in School of Music.  
Beginning and intermediate methods and literature for teaching piano. Observation and teaching of beginning piano students.  
QA: MUS 347
- 347\*.** **Keyboard Methods and Literature II**  
Spring. 2(2-0)  
P: MUS 346. R: Open only to majors in School of Music.  
Intermediate and advanced methods and literature for teaching piano. Observation and teaching of piano students.  
QA: MUS 348 MUS 349
- 348\*.** **Piano Accompanying**  
Fall, Spring. 1(0-3) May reenroll for a maximum of 8 credits.  
P: MUS 149. R: Not open to freshmen.  
Open only to students in School of Music.  
Accompaniment of instrumental and vocal soloists.  
QA: MUS 357
- 349\*.** **Piano Performance**  
Fall, Spring. 1(1-0) May reenroll for a maximum of 10 credits.  
C: MUS 150A or MUS 350A R: Open only to students in School of Music.  
Critique and analysis of individual performances in a group setting.
- 350A\*.** **Piano**  
Fall, Spring. 2 to 3 credits. May reenroll for a maximum of 18 credits.  
P: MUS 150A. R: Open only to majors in School of Music, approval of school.  
Private instruction in piano.  
QP: MUS 150A QA: MUS 350A
- 350B\*.** **Pipe Organ**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
P: MUS 150B. R: Open only to majors in School of Music, approval of school.  
Private instruction in pipe organ.  
QP: MUS 150B QA: MUS 350B
- 350C\*.** **Harp**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
P: MUS 150C. R: Open only to majors in School of Music, approval of school.  
Private instruction in harp.  
QP: MUS 150C QA: MUS 350C
- 351\*.** **Voice**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
P: MUS 151. R: Open only to majors in School of Music and to students in Music secondary teaching minor, approval of school.  
Private instruction in voice.  
QP: MUS 151 QA: MUS 351
- 352A\*.** **Violin**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 152A. R: Open only to majors in School of Music, approval of school.  
Private instruction in violin.  
QP: MUS 152A QA: MUS 352A
- 352B\*.** **Viola**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 152B. R: Open only to majors in School of Music, approval of school.  
Private instruction in viola.  
QP: MUS 152B QA: MUS 352B
- 352C\*.** **Cello**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 152C. R: Open only to majors in School of Music, approval of school.  
Private instruction in cello.  
QP: MUS 152C QA: MUS 352C
- 352D\*.** **Double Bass**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 152D. R: Open only to majors in School of Music, approval of school.  
Private instruction in double bass.  
QP: MUS 152D QA: MUS 352D
- 353A\*.** **Flute**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 153A. R: Open only to majors in School of Music, approval of school.  
Private instruction in flute.  
QP: MUS 153A QA: MUS 353A
- 353B\*.** **Oboe**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 153B. R: Open only to majors in School of Music, approval of school.  
Private instruction in oboe.  
QP: MUS 153B QA: MUS 353B
- 353C\*.** **Clarinet**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 153C. R: Open only to majors in School of Music, approval of school.  
Private instruction in clarinet.  
QP: MUS 153C QA: MUS 353C
- 353D\*.** **Saxophone**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 153D. R: Open only to majors in School of Music, approval of school.  
Private instruction in saxophone.  
QP: MUS 153D QA: MUS 353D
- 353E\*.** **Bassoon**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 153E. R: Open only to majors in School of Music, approval of school.  
Private instruction in bassoon.  
QP: MUS 153E QA: MUS 353E
- 354A\*.** **Trumpet**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 154A. R: Open only to majors in School of Music, approval of school.  
Private instruction in trumpet.  
QP: MUS 154A QA: MUS 354A
- 354B\*.** **Horn**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 154B. R: Open only to majors in School of Music, approval of school.  
Private instruction in horn.  
QP: MUS 154B QA: MUS 354B

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- 354C\*. Trombone**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 154C. R: Open only to majors in School of Music, approval of school. Private instruction in trombone.  
QP: MUS 154C QA: MUS 354C
- 354D\*. Euphonium**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 154D. R: Open only to majors in School of Music, approval of school. Private instruction in euphonium.  
QP: MUS 154D QA: MUS 354D
- 354E\*. Tuba**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 154E. R: Open only to majors in School of Music, approval of school. Private instruction in tuba.  
QP: MUS 154E QA: MUS 354E
- 355\*. Percussion**  
Fall, Spring. 1 to 4 credits. May reenroll for a maximum of 24 credits.  
P: MUS 155. R: Open only to majors in School of Music, approval of school. Private instruction in percussion.  
QP: MUS 155 QA: MUS 355
- 370\*. Music Therapy: Behavior Measurement and Assessment**  
Fall. 3(3-1)  
P: MUS 270. R: Open only to Music Therapy majors.  
Observation and assessment of behavior. Principles of behavioral change. Design of treatment. Ethics and standards of clinical practice. Field trips required.  
QA: MUS 400
- 371\*. Music Therapy: Treatment Planning and Case Management**  
Spring. 3(3-1)  
P: MUS 370. R: Open only to Music Therapy majors.  
Supervised clinical practice in music therapy. Goals and objectives of treatment. Design and evaluation of treatment programs. Field trips required.
- 380\*. Musical Styles and Forms**  
Fall. 3(3-1)  
P: MUS 281. R: Open only to majors in School of Music.  
Form in pre-20th century Western music. Stylistic analysis of representative medieval, renaissance, baroque, and 18th and 19th century compositions.  
QP: MUS 282 QA: MUS 380
- 381\*. 20th Century Music Theory**  
Spring. 3(3-1)  
P: MUS 380.  
Western art music and jazz. Stylistic and formal analysis of representative compositions and jazz improvisations. Post-tonal theory. Jazz nomenclature and harmonic practice.  
QP: MUS 381 QA: MUS 282 MUS 283
- 408\*. Piano Technology I**  
Fall. 3(2-2)  
P: MUS 309. R: Open only to majors in School of Music.  
Restoring the original tune of old pianos. Repairing or replacing all worn parts. Advanced concert tuning and tone regulation.  
QP: MUS 310 QA: MUS 408
- 409\*. Piano Technology II**  
Spring. 3(2-2)  
P: MUS 408. R: Open only to majors in School of Music.  
Restoring the original tune of old pianos. Repairing or replacing all worn parts. Advanced concert tuning and tone regulation.  
QP: MUS 408 QA: MUS 409 MUS 410
- 412\*. History of Oratorio**  
Spring of even-numbered years. 2(2-0)  
P: MUS 211. R: Open only to majors in School of Music.  
History and literature of oratorio since 1600.  
QP: MUS 226 QA: MUS 412
- 413\*. Keyboard Literature to Mid-19th Century**  
Fall of even-numbered years. 2(2-1)  
P: MUS 281. R: Open only to majors in School of Music.  
Keyboard styles and works of representative composers such as Bach, Couperin, Mozart, Haydn and Beethoven.  
QP: MUS 182 QA: MUS 415C
- 414\*. Keyboard Literature since the Mid-19th Century**  
Spring of odd-numbered years. 2(2-1)  
P: MUS 413. R: Open only to majors in School of Music.  
Keyboard styles and works of representative composers such as Schumann, Chopin, Ives and Prokofiev.  
QP: MUS 282 QA: MUS 416C MUS 417C
- 415\*. Art Song Literature: German**  
Fall of even-numbered years. 2(2-1)  
P: MUS 181. R: Open only to majors in School of Music.  
Standard art song repertoire with emphasis on German Lieder. Performance of art songs in class.  
QP: MUS 182 QA: MUS 415E
- 416\*. Art Song Literature: European and American**  
Spring of odd-numbered years. 2(2-1)  
P: MUS 181. R: Open only to majors in School of Music.  
Standard art song repertoire with emphasis on Italian, French, and 20th century art songs. Performance of art songs in class.  
QP: MUS 182 QA: MUS 416E
- 420\*. Music of the Eighteenth Century**  
Fall. 2(2-0)  
P: MUS 212 R: Not open to freshmen and sophomore Music only  
Music of late baroque and classical traditions: styles, genres, forms, theories, aesthetics, performance practices, instruments and masterworks in social/political context. Aural and score analysis of representative works.  
QP: MUS 182 QA: MUS 417A
- 421\*. Nineteenth-Century European-American Music Literature**  
Spring. 2(2-0)  
P: MUS 212 R: Not open to freshman or sophomore  
Music of late Baroque and Classical traditions: styles, genres, forms, theories, aesthetics, performance practice, instruments and masterworks in socio/political context. Aural and score analysis of representative works.  
QP: MUS 182 QA: MUS 415B
- 422\*. Twentieth-Century European and American Music Literature**  
Spring. 2(2-0)  
P: MUS 212 R: Not open to freshmen and sophomores  
Music of late baroque and classical traditions: styles, genres, forms, theories, aesthetics, performance practices, instruments and masterworks in socio/political context. Aural and score analysis of representative works.  
QP: MUS 182 QA: MUS 416B
- 423\*. History of Opera**  
Fall of odd-numbered years. 2(2-0)  
P: MUS 212. R: Open only to majors in School of Music.  
Musical, cultural, and social significance of opera since 1600.  
QP: MUS 226 QA: MUS 411
- 427\*. Music of Asia, the Pacific, and the Near East**  
Fall. 3(3-0)  
P: MUS 212. R: Open only to majors in School of Music.  
Music in the cultures of the Asian continent and Pacific islands. Techniques of ethnomusicology, listening and analysis.  
QP: MUS 226
- 428\*. Music of Africa, Europe, and the Americas**  
Spring. 3(3-0)  
P: MUS 212. R: Open only to majors in School of Music.  
Music in the cultures of Africa, Europe, and the Americas with emphasis on folk and vernacular traditions. Techniques of ethnomusicology, listening and analysis.  
QP: MUS 226
- 435\*. Opera Theatre**  
Fall, Spring. 1 to 2 credits. May reenroll for a maximum of 8 credits.  
P: Audition required.  
Rehearsal and performance of complete operas and operatic excerpts.  
QA: MUS 495
- 440\*. Electronic and Computer Music Literature**  
Fall. 3(3-0)  
P: MUS 281. R: Not open to freshmen and sophomores.  
Music literature composed with tape recorders, synthesizers and computers.  
QP: MUS 282 QA: MUS 439
- 441\*. Introduction to Computer Music**  
Fall. 3(3-0)  
P: MUS 281. R: Not open to freshmen.  
Digital synthesizers, samplers, and Musical Instrument Digital Interface. Computer sequencing and timbre editing software. Compositional techniques of computer music.  
QP: MUS 282 QA: MUS 440
- 442\*. Independent Projects in Computer Music**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
P: MUS 441.  
Independent composition or research in computer music. Assigned use of computer music studios.  
QP: MUS 441 QA: MUS 442
- 448\*. Advanced Keyboard Methods and Literature I**  
Fall. 2(2-0)  
P: MUS 347. R: Open only to majors in School of Music.  
Advanced piano literature for private lessons and classrooms.  
QA: MUS 462
- 449\*. Advanced Keyboard Methods and Literature II**  
Spring. 2(2-0)  
P: MUS 448. R: Open only to majors in School of Music.  
Advanced piano literature for private lessons and classrooms.  
QA: MUS 463 MUS 464
- 457\*. Teaching Instrumental Music in the Elementary School**  
Spring. 3(2-2) Interdisciplinary with the Department(s) of Teacher Education.  
P: MUS 260, MUS 339 R: Senior level and above Music Education Music Education minors  
Techniques for developing instrumental music programs in grades 4-6. Topics include curriculum, pedagogy, materials, and administration. Clinical experiences in the schools required.  
QP: MUS 250 QA: TE 320

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- 458\*.** **Teaching Instrumental Music in the Secondary School**  
 Spring. 3(2-2) Interdisciplinary with the Department(s) of Teacher Education.  
 P: MUS 260, MUS 339 R: Senior level and above Music Education Music Education minors  
 Techniques for developing choral music programs in grades 7-12. Topics include curriculum, pedagogy, materials, and administration. Clinical experiences in schools required.  
 QP: MUS 250 QA: TE 335
- 460\*.** **Computers in School Music**  
 Fall. 2(2-1)  
 R: Not open to Freshman and Sophomores  
 College of Education Music Education, Secondary Education minors  
 Techniques and principles of computer assisted instruction of music in school programs. Emphasis on appropriate software and hardware for teaching and management.  
 QA: MUS 431
- 461\*.** **Marching Band Methods**  
 Spring. 2(2-0)  
 R: Not open to Freshman and Sophomores  
 Arts and Letters Music Education secondary education minors  
 Complete administration of the public school marching band. Technical and philosophical characteristics.  
 QA: MUS 430
- 462\*.** **Suzuki Methods and Materials**  
 Spring. 2(1-2)  
 R: Open only to majors in School of Music.  
 Beginning levels of Suzuki violin pedagogy.
- 463\*.** **Methods and Materials of Elementary Music I**  
 Fall, Spring. 2(2-0)  
 P: MUS 135 or waiver R: Junior level and above Education, Family and Child Ecology  
 Comprehensive and practical understanding of how children learn music from early childhood to grade three.  
 QP: MUS 135
- 464\*.** **Methods and Materials of Elementary Music II**  
 Spring. 2(2-0)  
 P: MUS 463 R: Junior level and above Education; Family and Child Ecology  
 A comprehensive and practical understanding of how children in grades 4-6 learn music.  
 QP: MUS 135 QA: MUS 345
- 465\*.** **Music in Early Childhood**  
 Fall, Spring. 2(2-0)  
 P: Music 260 R: Not open to freshmen and sophomore Arts and Letters, College of Education. Music, Education Minors.  
 Experience in planning music learning activities and teaching strategies for children of ages three to six.  
 QP: MUS 250
- 466\*.** **Literature for Teaching General Music, K-6**  
 Spring. 2(2-1)  
 P: TE 401 and 402 R: Seniors. Arts and Letters. Music Education. Fine Arts minors (College of Ed.).  
 Musical materials for listening and performance in general music classes, K-6; composed music from classic styles, folk music, and music of diverse cultures.  
 QP: TE321 TE 335TE 336MUS 345 QA: MUS 404
- 467\*.** **Teaching General Music in the Elementary School**  
 Fall. 3(2-2) Interdisciplinary with the Department(s) of Teacher Education.  
 P: MUS 260, MUS 339 R: Senior level and above Music Education Music Education minors  
 Techniques for teaching general music to students in grades K-6. Topics include curriculum, pedagogy, materials, and administration. Clinical experiences in the schools required.  
 QP: MUS 250 QA: TE321
- 468\*.** **Teaching Choral Music in the Secondary School**  
 Spring. 3(2-2) Interdisciplinary with the Department(s) of Teacher Education.  
 P: MUS 260, MUS 339 R: Senior level and above Music Education Music Education minors  
 Techniques for developing choral music programs in grades 7-12. Topics include curriculum, pedagogy, materials, and administration. Clinical experience in the schools required.  
 QP: MUS 250 QA: TE 336
- 470\*.** **Music Therapy: Mental and Behavioral Disabilities**  
 Fall. 3(3-1)  
 P: MUS 371. R: Open only to Music Therapy majors.  
 Use of music therapy to treat clients with mental and behavioral disabilities. Clinical practicum required.  
 QA: MUS 470
- 471\*.** **Music Therapy: Physical and Developmental Disabilities**  
 Spring. 3(3-1)  
 P: MUS 470. R: Open only to Music Therapy majors.  
 Use of music therapy to treat clients with physical and developmental disabilities. Clinical practicum required.  
 QA: MUS 471 MUS 472
- 476\*.** **Psychology of Music: Foundations**  
 Fall. 3(3-0) Interdisciplinary with the Department(s) of Psychology.  
 R: Not open to freshmen and sophomores  
 Psychological foundations of musical behavior; psychoacoustics, neurophysiological processing of music, affective behavior to music, musical preference, function of music in society, nature of musical talent.  
 QA: PSY 486
- 477\*.** **Psychology of Music: Research Applications**  
 Spring. 2(2-0) Interdisciplinary with the Department(s) of Psychology.  
 P: MUS 476 R: Not open to freshmen or sophomore  
 Experimental research proposal writing, research projects using human subjects, applying selected statistical procedures on the results.  
 QP: PSY 486 QA: PSY 487
- 480\*.** **Counterpoint**  
 Fall, Spring. 2(2-0)  
 P: MUS 381. R: Open only to majors in School of Music.  
 Creative and analytical work with two-and three-part counterpoint in the style of J.S. Bach.  
 QA: MUS 386 MUS 387 MUS 388
- 483\*.** **Composition**  
 Fall, Spring. 2(-) May reenroll for a maximum of 12 credits.  
 P: MUS 281. R: Open only to majors in School of Music.  
 Private instruction in music composition.  
 QP: MUS 282 QA: MUS 483
- 484\*.** **Instrumentation and Basic Orchestration**  
 Fall. 2(2-1)  
 P: MUS 381. R: Open only to majors in School of Music.  
 Four families of orchestral instruments: strings, woodwinds, brass, and percussion. Acoustics, notation, range, articulation, dynamics, technique, and timbre for individual instruments and orchestral sections.  
 QP: MUS 282 QA: MUS 383
- 485\*.** **Advanced Orchestration**  
 Spring. 2(2-0)  
 P: MUS 484. R: Open only to majors in School of Music.  
 Transcription techniques. Orchestral devices and styles. Additional percussion material, harp, and auxiliary instruments.  
 QP: MUS 383 QA: MUS 384 MUS385
- 490\*.** **Independent Study**  
 Fall, Spring, Summer. 1 to 3 credits.  
 May reenroll for a maximum of 9 credits.  
 R: Approval of the School  
 Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.  
 QA: MUS 490
- 491\*.** **Special Topics in Music**  
 Fall, Spring, Summer. 1 to 4 credits.  
 May reenroll for a maximum of 10 credits.  
 R: Approval of the School  
 Special topics supplementing regular course offerings proposed by faculty on a group study basis.  
 QA: MUS 499
- 493\*.** **Music Therapy: Clinical Practicum**  
 Fall, Spring, Summer. 1(-)  
 P: MUS 471. R: Open only to Music Therapy majors.  
 Six months of internship in an approved music therapy clinical program at an accredited treatment center.  
 QP: MUS 472 QA: MUS 400
- 800\*.** **Introduction to Graduate Theory**  
 Fall. 1(1-1)  
 R: Music majors only.  
 Elements of music theory, with emphasis on voice leading and harmonic analysis in diatonic and chromatic music.
- 801\*.** **Graduate Aural Skills**  
 Spring. 1(1-1)  
 R: Music majors only.  
 Development of aural and sight-singing skills.
- 830\*.** **Research Methods and Materials**  
 Fall. 1 to 3 credits. May reenroll for a maximum of 3 credits.  
 Organization, presentation, and documentation of research; critical examination of encyclopedias, indices, databases and other aids.  
 QA: MUS 824
- 835\*.** **Medieval Music**  
 Fall. 3(3-0)  
 P: MUS 830 recommended.  
 Investigation of various developments in European music to 1400. Some attention given to Gregorian chant as well as to various types of secular monophony, but greater stress is laid on the forms and styles of polyphonic music.  
 QP: MUS 824 MUS 226MUS 824 QA: MUS 915

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**836\*.** **Renaissance Music**  
 Spring. 3(3-0)  
 P: MUS 830 recommended.  
 Investigation of developments in European music from 1400 to 1600, tracing developments in both sacred and secular music.  
 QP: MUS 824 MUS 226MUS 824 QA: MUS 916 MUS 415A

**837\*.** **Seventeenth-Century Music**  
 Fall. 3(3-0)  
 P: MUS 830 recommended.  
 Instrumental and vocal music in Europe from 1600 to 1700, tracing development of genres and of national styles.  
 QP: MUS 824 MUS 226MUS 824 QA: MUS 917 MUS 416A

**845\*.** **Minor Instrument Study: Voice**  
 Fall, Spring. 1(1-0) May reenroll for a maximum of 8 credits.  
 R: Music Audition required.  
 Study of vocal techniques for students in majors other than voice.  
 QA: MUS 851

**846\*.** **Minor Instrument Study: String**  
 Fall, Spring. 1(1-0) May reenroll for a maximum of 8 credits.  
 R: Music Audition required  
 Secondary string instrument study for students enrolled in string specialist program.  
 QA: MUS 846

**847\*.** **Minor Instrument Study: Brass**  
 Fall, Spring. 1(1-0) May reenroll for a maximum of 8 credits.  
 R: Music Audition required  
 Secondary instrument study for students enrolled in the brass specialist program.  
 QA: MUS 847

**848\*.** **Minor Instrument Study: Woodwind**  
 Fall, Spring. 1(1-0) May reenroll for a maximum of 8 credits.  
 R: Music Audition required.  
 Secondary instrument study in flute, clarinet, oboe, bassoon and saxophone.  
 QA: MUS 848

**849\*.** **Minor Instrument Study: Piano**  
 Fall, Spring. 1(1-0) May reenroll for a maximum of 8 credits.  
 R: Music Audition required  
 Private instruction in piano for students whose major instrument is not piano.  
 QA: MUS 849

**850A\*.** **Piano**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in piano.  
 QA: MUS 850A

**850B\*.** **Organ**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in pipe organ.  
 QA: MUS 850B

**850C\*.** **Harp**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in harp.  
 QA: MUS 850C

**851\*.** **Voice**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in voice.  
 QA: MUS 850D

**852A\*.** **Violin**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in violin.  
 QA: MUS 850E

**852B\*.** **Viola**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in viola.  
 QA: MUS 850F

**852C\*.** **Cello**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in cello.  
 QA: MUS 850G

**852D\*.** **Double Bass**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in double bass.  
 QA: MUS 850H

**853A\*.** **Flute**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in flute.  
 QA: MUS 850I

**853B\*.** **Oboe**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in oboe.  
 QA: MUS 850J

**853C\*.** **Clarinet**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in clarinet.  
 QA: MUS 850K

**853D\*.** **Saxophone**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: music audition required  
 Private instruction in saxophone.  
 QA: MUS 850L

**853E\*.** **Bassoon**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in bassoon.  
 QA: MUS 850M

**854A\*.** **Trumpet**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in trumpet.  
 QA: MUS 850N

**854B\*.** **Horn**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in horn.  
 QA: MUS 850O

**854C\*.** **Trombone**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in trombone.  
 QA: MUS 850P

**854D\*.** **Euphonium**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in euphonium.  
 QA: MUS 850Q

**854E\*.** **Tuba**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in tuba.  
 QA: MUS 850R

**855\*.** **Percussion**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 18 credits.  
 R: Music Audition required  
 Private instruction in percussion.  
 QA: MUS 850S

**856\*.** **Chamber Music**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
 R: Music Audition required.  
 Chamber music performance, coached  
 QA: 813

**857\*.** **Performance of 20th-Century Music**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 12 credits.  
 R: Music Audition required  
 Coached chamber music performance of 20th-century works.  
 QA: MUS 857

**858A\*.** **Seminar in Band Conducting**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 36 credits.  
 R: Music Audition required.  
 Advanced band conducting, including core repertoire examination and execution with emphasis on score analysis and preparation.  
 QA: MUS 836A

**858B\*.** **Seminar in Orchestral Conducting**  
 Fall, Spring. 3(3-0) May reenroll for a maximum of 36 credits.  
 R: Music Audition required  
 Advanced conducting techniques for the advanced orchestral literature of all periods and styles (string orchestra, chamber orchestra, symphony orchestra).  
 QA: MUS 836B

**858C\*.** **Seminar in Choral Conducting**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 36 credits.  
 R: Music Audition required  
 Advanced conducting techniques applicable to choral and instrumental music of all periods.  
 QA: MUS 836C

**859\*.** **Choral Techniques and Materials**  
 Spring of even-numbered years. 3(3-0)  
 May reenroll for a maximum of 15 credits.  
 Advanced development of choral proficiency. Demonstrations of choral techniques, conducting by students, examination and evaluation of new materials. Variable content.  
 QA: MUS 852

**860\*.** **Seminar in History & Philosophy of Music Education**  
 Spring of even-numbered years. 2(2-0)  
 R: Arts & Letters or College of Education  
 Presents the major philosophies that influence American music education and traces the rise of music curricula and studies from Ancient Greece to the present.  
 QA: MUS 803

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- 862\* Seminar in Psychology of Music Education**  
 Fall. 2(2-0)  
*R: Arts & Letters or College of Education*  
 Psychological foundations of music teaching and learning. Important systems or schools of psychology. Psychological research on important problems of music teaching.  
 QA: MUS 804
- 862\* Seminar in Music Curriculum Development**  
 Fall. 2(2-0)  
*R: Arts & Letters or College of Education*  
 Explores the history of and trends in music education curriculum, the process of curriculum development and all its components, and curricular models.  
 QA: MUS 805
- 863\* Seminar in Music Education Methodology**  
 Spring of odd-numbered years. 2(2-0)  
*R: Arts and Letters or College of Education*  
 Acquaints experienced music educators with psychological, philosophical, aesthetic and subject matter theories of methods/pedagogy that undergird music education.  
 QA: MUS 806
- 864\* Research in Music Education**  
 Fall. 3(3-0)  
*R: Arts & Letters or College of Education*  
 Methods of research in music education. Conceptual basis of a study, systematic information retrieval, and proposal writing.  
 QA: MUS 811
- 865\* Advanced Methods and Materials in Secondary Music Education**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
 Workshop in current methods and materials for teaching music in the secondary schools. Topics will vary with instructor.  
 QA: MUS 820
- 866\* Advanced Methods and Materials in Elementary Music Education**  
 Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
 Workshop in current methods and materials for teaching music in the elementary schools. Topics will vary with instructor.  
 QA: MUS 821
- 868\* Current Studies in Music Therapy**  
 Fall. 2(2-0)  
*P: MUS 864 recommended. R: Music*  
 Evaluates outcomes and inferences from current research in Music Therapy, topics such as music psychotherapy, physical medicine, stress and pain reduction or traumatic brain injury.  
 QA: MUS 812
- 869\* Education, Training and Administration in Music Therapy**  
 Spring. 2(2-0)  
*R: Music*  
 Development of Music Therapy curriculum and clinical training; administration of Music Therapy clinical and educational programs.  
 QA: MUS 812
- 870\* Contrapuntal Techniques I**  
 Fall of odd-numbered years. 3(3-0)  
*R: Music*  
 An in-depth study of the techniques of voice-leading through imitative counterpoint. Development of skills in writing compositional exercises after the models of sacred vocal polyphony of the sixteenth century, principally Palestrina and Victoria.  
 QA: MUS 970
- 871\* Contrapuntal Techniques II**  
 Spring of even-numbered years. 3(3-0)  
*P: MUS 870 R: Music*  
 Development of skills in writing composition exercises after the models of instrumental polyphony of the eighteenth century, principally J.S. Bach. The influence of fugal technique is analyzed in the nineteenth and twentieth centuries.  
 QA: MUS 971
- 872\* Tonal Forms**  
 Fall. 2(2-0)  
*R: Music*  
 Investigation of how pieces of music from the common-practice period are put together into various structural units through the interplay of melody, harmony, rhythm, and timbre.  
 QA: MUS 880
- 873\* Early Twentieth-Century Techniques**  
 Spring. 2(2-0)  
*R: Music*  
 Investigation of melodic, harmonic, rhythmic, and textural devices employed in early twentieth-century music.  
 QA: MUS 880
- 874\* Schenkerian Analysis**  
 Fall. 2(2-0)  
*R: Music*  
 The thought, works and influences of the Austrian Theorist Heinrich Schenker. Techniques of linear analysis which emphasize the role of long-range voice-leading musical structure are compared to earlier theories of root progression.  
 QA: MUS 963
- 875\* Problems in Analysis**  
 Fall of odd-numbered years. 3(3-0)  
 May reenroll for a maximum of 6 credits.  
*R: Music*  
 Detailed analysis of choral, orchestral, and band music repertoire as a means of enhancing interpretation and performance.  
 QA: MUS 860
- 876\* History of Music Theory**  
 Fall of odd-numbered years. 3(3-0)  
*P: MUS 830 recommended R: Music*  
 Survey of principal Western theories of music from Pythagoras to the present. Focus on ideas that contributed to the development of modern musical thought and their place in Western intellectual history.  
 QA: MUS 943
- 880\* Composition**  
 Fall, Spring. 2(2-0) May reenroll for a maximum of 24 credits.  
*R: Music*  
 Advanced guided projects in creative writing of music.  
 QA: MUS 835
- 881\* Seminar in Composition**  
 Fall, Spring. 2(2-0) May reenroll for a maximum of 20 credits.  
*R: Music*  
 Study of contemporary music with emphasis on compositional procedures.  
 QA: MUS 834
- 882\* Composition with Computers**  
 Fall. 2(2-1)  
*R: Music*  
 Current applications of microcomputer technology in musical composition. Use of the School of Music Computer Music Studio and its associated hardware and software.  
 QA: MUS 870
- 883\* Advanced Computer Music Projects**  
 Spring. 1 to 4 credits. May reenroll for a maximum of 12 credits.  
*P: MUS 882 or MUS 441*  
 Techniques and principles of composition and research with computers. Use of computer hardware and software.  
 QA: MUS 871
- 890\* Independent Study**  
 Fall, Spring, Summer. 1 to 10 credits. May reenroll for a maximum of 40 credits.  
*R: Approval of the School*  
 Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.
- 891\* Special Topics**  
 Fall, Spring, Summer. 1 to 10 credits. May reenroll for a maximum of 50 credits.  
*R: Approval of the School*  
 Special topics supplementing regular course offerings proposed by faculty on a group study basis for graduate students.
- 892A\* Seminar in Music History**  
 Fall, Spring. 1 to 6 credits. May reenroll for a maximum of 24 credits.  
*R: Approval of School*  
 Study in various areas of music history, such as major composers, development of genres, criticism, or cultural context.  
 QA: MUS 802 MUS 812
- 898\* Master's Research--Plan B**  
 Fall, Spring, Summer. 1 to 10 credits. May reenroll for a maximum of 40 credits.  
*R: Approval of the School*  
 Directed research in support of plan B master's degree requirements.
- 899\* Master's Thesis Research--Plan A**  
 Fall, Spring, Summer. 1 to 10 credits. May reenroll for a maximum of 40 credits.  
*R: Approval of the School*  
 Directed research leading to a master's thesis, used in partial fulfillment of plan A master's degree requirements.  
 QA: MUS 899
- 935\* Seminar in Eighteenth-Century Music**  
 Spring of odd-numbered years. 3(3-0)  
*P: MUS 420 and MUS 830 recommended.*  
*R: Music*  
 Research on topics in eighteenth-century music.  
 QA: MUS 918
- 936\* Seminar in Nineteenth-Century Music**  
 Fall of even-numbered years. 3(3-0)  
*P: MUS 421 and MUS 830 recommended.*  
*R: Music*  
 Intensive study of selected topics in 19th-century music.  
 QP: MUS 824 MUS 415B QA: MUS 919
- 937\* Seminar in Twentieth-Century Music**  
 Spring of even-numbered years. 3(3-0)  
*P: MUS 422 and MUS 830 recommended*  
*R: Music*  
 Intensive study of selected topics in 20th-century music.  
 QP: MUS 824 MUS 416B QA: MUS 920

MUSIC

- 950A\*.** **Piano**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required.  
Private instruction in piano.  
QA: MUS 950A
- 950B\*.** **Organ**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in pipe organ.  
QA: MUS 950B
- 950C\*.** **Harp**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in harp.  
QA: MUS 950C
- 951\*.** **Voice**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required.  
Private instruction in voice.  
QA: MUS 950D
- 952A\*.** **Violin**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in violin.  
QA: MUS 950E
- 952B\*.** **Viola**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in viola.  
QA: MUS 950F
- 952C\*.** **Cello**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in cello.  
QA: MUS 950G
- 952D\*.** **Double Bass**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in double bass.  
QA: MUS 950H
- 953A\*.** **Flute**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required.  
Private instruction in flute.  
QA: MUS 950I
- 953B\*.** **Oboe**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in oboe.  
QA: MUS 950J
- 953C\*.** **Clarinet**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in clarinet.  
QA: MUS 950K
- 953D\*.** **Saxophone**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in saxophone.  
QA: MUS 950L
- 953E\*.** **Bassoon**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in bassoon.  
QA: MUS 950M
- 954A\*.** **Trumpet**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in trumpet.  
QA: MUS 950N
- 954B\*.** **Horn**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in horn.  
QA: MUS 950O
- 954C\*.** **Trombone**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in trombone.  
QA: MUS 950P
- 954D\*.** **Euphonium**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required  
Private instruction in euphonium.  
QA: MUS 950Q
- 954E\*.** **Tuba**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required.  
Private instruction in tuba.  
QA: MUS 950R
- 955\*.** **Percussion**  
Fall, Spring. 1 to 3 credits. May reenroll for a maximum of 24 credits.  
R: Music Audition required.  
Private instruction in percussion.  
QA: MUS 950S
- 960\*.** **Seminar in Measurement of Musical Behavior**  
Spring of odd-numbered years. 2(2-0)  
P: MUS 864 and MUS 965 recommended.  
R: College of Education or Arts and Letters  
Theory and practice in the measurement of musical behavior in the cognitive, affective and psychomotor domains.  
QP: MUS 811 MUS 956 QA: MUS 903
- 961\*.** **Seminar in Music Teacher Education**  
Fall of odd-numbered years. 2(2-0)  
R: College of Education or Arts & Letters  
Issues, techniques and problems in the training of school music educators.  
QA: MUS 903
- 962\*.** **Seminar in Aesthetics in Music Education**  
Fall of even-numbered years. 2(2-0)  
R: College of Education or Arts & Letters  
Historical foundations of aesthetics, development of the concept of aesthetic education, and implementation of the same in the music classroom.  
QA: MUS 903
- 963\*.** **Seminar in Administration of Music Programs**  
Spring of even-numbered years. 2(2-0)  
R: College of Education or Arts & Letters  
Techniques and problems in administering school and higher education music programs.  
QA: MUS 954
- 964\*.** **Seminar in Current Trends in Music Education**  
Fall of odd-numbered years. 2(2-0)  
R: Arts and Letters, College of Education  
Study and research of current trends in music education, 1950-present. A comparison of current trends with former trends/tendencies in American music education, 1600-1950.  
QA: MUS 955
- 965\*.** **Advanced Research Methods in Music Education**  
Fall. 3(3-0)  
P: MUS 864 recommended R: Arts and Letters or College of Education  
Advanced skill development in the execution and computerized statistical analysis of music education research projects.  
QP: MUS 811 QA: MUS 956
- 970\*.** **Pedagogy of Theory I**  
Fall of odd-numbered years. 2(2-0)  
R: Music  
Organization, goals, and procedure of undergraduate teaching in music theory. Choice and sequencing of topics, pacing, supplementary materials, educational philosophies, and relevance to performance. Worksheets, creative projects and testing strategies.  
QA: MUS 843
- 971\*.** **Pedagogy of Theory II**  
Spring of even-numbered years. 2(2-0)  
R: Music  
Study of organization of undergraduate courses in ear training and sight singing, various methods of approach, and practical application to general musicianship.  
QA: MUS 844)
- 972\*.** **Analytical Studies I**  
Fall. 3(3-0)  
R: Music  
Detailed analysis of melody, harmony, rhythm, color, texture, counterpoint, and structure in selected musical masterpieces from the 13th century to the early 19th century.  
QA: MUS 960
- 973\*.** **Analytical Studies II**  
Spring. 3(3-0)  
R: Music  
Detailed analysis of melody, harmony, rhythm, color, texture, counterpoint, and structure in selected musical masterpieces from the 19th and 20th centuries.  
QA: MUS 961
- 974\*.** **Atonality, Serialism, and Set Theory**  
Spring. 2(2-0)  
R: Music Majors only  
The study of atonal and paratonal music and related compositional and analytical systems, including serialism, integral serialism, and set theory.  
QA: MUS 964
- 975\*.** **Readings in Music Theory**  
Spring of odd-numbered years. 2(2-0)  
P: MUS 830 recommended R: Music  
Readings drawn from current journals and books. Analytical methodologies are examined in detail. Students write a research paper of the type and quality suitable for publication in student theory association journals.
- 980\*.** **Composition**  
Fall, Spring. 2(2-0) May reenroll for a maximum of 24 credits.  
R: Music  
Advanced guided projects in creative writing of music.  
QA: MUS 835

MUSIC

**990\*.** **Doctoral Independent Study**  
 Fall, Spring, Summer. 1 to 10 credits.  
 May reenroll for a maximum of 40 credits.  
 R: Approval of the School  
 Special projects, directed reading, and research arranged by an individual doctoral candidate and a faculty member in areas supplementing the regular course offerings.

**991\*.** **Special Topics**  
 Fall, Spring, Summer. 1 to 10 credits.  
 May reenroll for a maximum of 50 credits.  
 R: Approval of the School  
 Special topics supplementing regular course offerings proposed by faculty on a group study basis for doctoral candidates.

**992A\*.** **Seminar in Musicology**  
 Spring. 3(3-0) May reenroll for a maximum of 18 credits.  
 P: MUS 830 recommended  
 Study in various areas of musicology, such as early notations, music editing, or historical performance practices.  
 QP: MUS 824 QA: MUS 924

**999\*.** **Doctoral Dissertation Research**  
 Fall, Spring, Summer. 1 to 60 credits.  
 May reenroll for a maximum of 60 credits.  
 R: Approval of the School  
 QA: MUS 999

**NATURAL SCIENCE NSC**

**201\*.** **Science Problem Solving Seminar I**  
 Fall. 2(2-0)  
 P: Drew Section of MTH 0823 or MTH 116 or MTH 132 concurrently. R: Approval of college.  
 Problem solving principles and strategies used in the disciplines of science and mathematics. Activities reflecting the types of problems encountered.  
 QA: NSC 201

**202\*.** **Science Problem Solving Seminar II**  
 Spring. 2(2-0)  
 P: NSC 201. R: Approval of college.  
 Continuation of NSC 201.  
 QA: NSC 202

**203\*.** **Drew Laboratory Directed Studies**  
 Fall, Spring, Summer. 1 to 2 credits.  
 May reenroll for a maximum of 6 credits.  
 P: NSC 202. R: Open only to Drew Laboratory students.  
 Using topics related to a faculty member's ongoing research, students explore the relationship between science and technology and social issues.  
 QA: NSC 203

**401\*.** **Science Laboratories for Secondary Schools**  
 Fall. 4(2-6)  
 R: Open only to seniors in the College of Natural Science with a teacher certification option.  
 Laboratory equipment, supplies, demonstrations, exercises, and safety. Care of live organisms. Disposal of biological and chemical wastes. Field trips required.

**499\*.** **Research**  
 Fall, Spring, Summer. 1 to 4 credits.  
 May reenroll for a maximum of 6 credits.  
 R: Open only to juniors and seniors in the College of Natural Science with a teacher certification option.  
 Research in faculty laboratories. Oral and written presentations.

**800\*.** **Problems in Biological or Physical Science for Teachers**  
 Fall, Spring, Summer. 3 to 8 credits.  
 May reenroll for a maximum of 8 credits.  
 P: Secondary teachers not in degree program  
 Supervised investigation into problems in Biological or Physical Science.  
 QA: BS 800 PHS 890

**802\*.** **Essentials of Electron Microscopy**  
 Fall, Spring. 2(2-0)  
 Principles of operation and uses of transmission and scanning electron microscopy. Related electron beam instruments. Specimen preparation and analytical methods.  
 QA: NSC 802

**810\*.** **Transmission Electron Microscopy Laboratory**  
 Fall, Spring, Summer. 3(1-4)  
 P: NSC 802, R: approval of department.  
 Use of transmission microscope and preparative equipment. Preparation techniques for specimens, photographic and darkroom use, and interpretation of micrographs.  
 QP: NSC 802 QA: NSC 810

**820\*.** **Scanning Electron Microscopy; Energy Dispersive X-ray Microanalysis**  
 Fall, Spring. 3(1-4)  
 P: NSC 802 or concurrently; R: approval of department.  
 Use of scanning electron microscope and energy dispersive x-ray microanalysis. Machine variables, artifacts, quantitative analysis, specimen preparation, darkroom procedures.  
 QP: NSC 802 QA: NSC 820 NSC 840

**825\*.** **Special Problems in Electron Microscopy**  
 Fall, Spring, Summer. 1 to 3 credits.  
 May reenroll for a maximum of 40 credits.  
 P: NSC 802; NSC 810 or NSC 820. Approval of department. R: Approval of department.  
 Use of electron microscopy techniques for selected research topics.  
 QP: NSC 802 AND NSC 810 OR NSC 820 QA: NSC 801

**850\*.** **Cell and Molecular Biology**  
 Summer. 2(-)  
 P: Secondary certification in biology; 3 years teaching experience C: NSC 851 R: Master's candidates or Postbaccalaureate Natural Science Biological Science by application to Division of Science Education  
 Molecular basis of structure and function of cells. Protein structure and function, cell physiology, metabolic energy and transmission of genetic information.  
 QA: NSC 850

**851\*.** **Cell and Molecular Biology Laboratory**  
 Summer. 3(-)  
 P: Secondary certification in biology; 3 years teaching experience C: NSC 850 R: Master's candidates or postbaccalaureate Natural Science Biological Science  
 Generation of laboratory exercises appropriate for secondary students.  
 QA: NSC 851

**852\*.** **Interdisciplinary Seminar in Biological Science**  
 Fall, Spring, Summer. 1(-)  
 P: Approval of Division of Science Education R: Master's Candidates or postbaccalaureate Natural Science Biological Science  
 Interrelationships of biological science and technology. Role of society in regulation of research and technological innovations  
 QA: NSC 852

**855\*.** **Environmental and Behavioral Biology**  
 Summer. 2(-)  
 P: Secondary certification in biology; 3 years teaching experience C: NSC 856 R: Master's Candidates or postbaccalaureate Natural Science Biological Science  
 Biotic and abiotic features of lakes, streams, forest ecosystems, and microbial ecosystems.  
 QA: NSC 855

**856\*.** **Environmental and Behavioral Biology Laboratory**  
 Summer. 3(-)  
 P: Secondary certification in biology; 3 years teaching experience C: NSC 855 R: Master's candidates or postbaccalaureate Natural Science Biological Science  
 Laboratory and field examinations of lake, stream and forest ecosystems.  
 QA: NSC 856

**860\*.** **Problem Solving Techniques in Physical Science**  
 Summer. 3(-)  
 P: Secondary certification in chemistry or physics or earth science; R: Master's candidates or postbaccalaureate Natural Science Physical Science  
 Measurement and analysis of chemical, physical, and geological phenomena.

**861\*.** **Chemistry for Teachers**  
 Summer. 2(-)  
 P: NSC 860 R: Master's candidates or postbaccalaureate Natural Science Physical Science  
 Intensive lecture and laboratory study of basic chemistry from a modern viewpoint

**862\*.** **Physics for Teachers**  
 Summer. 2(-)  
 P: NSC 860; secondary certification in Physical Sciences. R: Open only to Master's degree or postbaccalaureate students in Physical Science.  
 Intensive lecture and laboratory study of basic physics from a modern viewpoint.

**863\*.** **Earth Science for Teachers**  
 Summer. 2(-)  
 P: NSC 860; secondary certification in chemistry, physics, earth science. <P  
 R: Open only to Master's degree or postbaccalaureate students in Physical Science.  
 Intensive lecture and laboratory study of basic earth sciences from a modern viewpoint.

**864\*.** **Interdisciplinary Seminar in Physical Science**  
 Summer. 2(-)  
 P: NSC 861 and 862 and 863 R: Master's degree candidates or postbaccalaureate Natural Science Physical Science  
 Interrelationships of the physical sciences. The role of society in regulation of science to technology transfer.

**889\*.** **Research for Inservice Teachers**  
 Fall, Spring, Summer. 1 to 8 credits.  
 May reenroll for a maximum of 10 credits.  
 R: Open only to inservice K-12 teachers with baccalaureate degrees.  
 Research in faculty laboratories. Oral and written presentations.