MUS 360: SPECIAL TOPICS (4 quarter-units)
School of Music
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Topics in Musicianship: Introduction to acoustical and cognitive aspects of music composition and performance

COURSE DESCRIPTION

The course is an introduction to and survey of the study of music as sound and a product of cognitive behavior. Acoustical, perceptual, and cognitive principles are addressed from within specific scenarios linked to music composition and performance. No formal background in acoustics and psychology is assumed.

The aim of the course is to offer music majors (a) an understanding of the broad physical, physiological, and cognitive issues related to music in general and music listening in particular and (b) means to explore such issues creatively in composition and performance. Students are encouraged to go beyond the music-as-notation approach and take advantage of developments in several music disciplines that can inform and expand on traditional music theory.

Traditional approaches are compared to current work in the field, and music is examined from within a wide range of disciplines including psychoacoustics (link between vibrational, physiological, and perceptual frames of reference), music cognition (cognitive aspects of organizing sounds into music - cognitive aspects of musical meaning and emotion), semiotics (issues of communication and meaning), and experimental aesthetics. The main approach is that of empirical science, but other modes of acquiring knowledge (*e.g.* phenomenology) are also addressed. Discussion of the theoretical and philosophical bases for the scientific study of music and of our responses to it provides a unifying theme throughout the course.

The main topics covered are:

a) Philosophy of science – History of music science – Scientific aspects of music research –
b) Process of empirical investigation – Empirical approach to musical questions
c) Music as waves – Music as sensation – Music as cognition
d) Behaviorism – Neo-Behaviorism – Gognitivism
e) Gestalt principles – Information theory – Theories of emotion in music
f) Empirical and phenomenological aspects of musical communication as manifested in film music

The course will not address in detail the topics of sound production by different musical instruments, room acoustics, electronic music composition, or music therapy, although some relevant aspects will be discussed in the form of examples throughout the course.

COURSE REQUIREMENTS

Attendance is compulsory. Only up to 2 pre-approved absences will be granted per student for minimum penalty (1 point). Additional absences will be penalized more severely (4 points). The course will be conducted in a lecture format and involves multimedia demonstrations. No textbook purchase is required. All material, textual or otherwise, will be available online through Blackboard. **All students must have access to a computer with internet and multimedia capabilities** (latest, java-enabled Internet Explorer – Real Player – speakers / headphones).

There will be a **midterm** and a **final exam**, both consisting of a set of definitions, a set of short- and long-answer types of questions, and audio/visual examples. Questions regarding exam grades will be addressed during office hours and/or by email.

At the end of the quarter each student is expected to complete a **final paper** (≥5 double-spaced pages long) expanding upon any topic covered in class, as it relates to each student's areas of interest. The paper must include, research question(s), proper literature review, relevant citations, and a bibliography. Other final project options may be available depending on student background.

GRADING

Midterm Exam: 30%
Final Exam: 35%
Final Project: 25%
Attendance: 10%
Extra Credit: 5%

Final grading will be on the scale:
A: 100-94% **A-**: 93-89%
B+: 88-85% **B**: 84-81%
B-: 80-77% **C+**: 76-73%
C: 72-69% **C-**: 68-65%
D: 64-61% **F**: 60-0%

TEXTBOOKS – READING – CLASS MATERIAL

All required reading and multimedia material will be available through Blackboard. Go to http://oll.depaul.edu and log in using your Campus Connect ID and password.

Textbook

Butler, D. (1992). *The Musician's Guide to Perception and Cognition*. New York: Schirmer Books.
*****The textbook is out of print. It has been posted online with the permission of the author. Any use of the material outside the context of this class is prohibited by law.

Additional required reading

Class lecture notes and multimedia material (musical examples, videos, animations, applets, etc.) for each week will be provided **online** by 12:00 noon every Monday (before the weekly class meetings). The lecture notes will include some discussion on the readings as well as additional information presented in class. All students must have access to a computer with internet, printing, and multimedia capabilities (latest, java-enabled Internet Explorer – Real Player – speakers / headphones).

Gabrielsson, A. (2000). "Timing in music performance and its relations to music experience," in *Generative Processes in Music: The Psychology of Performance, Improvisation, and Composition* (27-51), J. A. Sloboda, editor (2nd edition). Oxford: Oxford University Press, Inc. [Read pp. 27-31; 46-48]
[Call # (1st edition): 780.2 G326S]

Johnston, I. (2002). *Measured Tones: The Interplay of Physics and Music* (2nd edition). Philadelphia: Institute of Physics Publishing Ltd. [Chapters 1 & 9 and Appendixes]
[Call # (1st edition) 781.2 J72M1989]

Kastner, M. P. and Crowder, R. G. (1990). "Perception of the major/minor distinction: IV. Emotional connotations in young children," *Music Perception*, 8(2): 189-201.

Kendall, R. A. (2005). "Music and video iconicity: theory and experimental design," *J. Physiol. Anthropol. Appl. Human Sci.*, 24(1):143-149.

Kendall, R. A. and Carterette, E. C. (1990). "The communication of musical expression," *Music Perception*, 8(2): 129-164.

Kerlinger, F. N., and Lee, H. B. (2000). *Foundations of Behavioral Research* (4th edition). Toronto: Thompson Learning. [Chapter 1]
[Call # 150.72 K39fa2000]

Meyer, L. B. (1956). *Emotion and Meaning in Music*. Chicago: University of Chicago Press. [Chapters 1 & 2]
[Call #: 780.1 M612E]

Palmer, C. (1996). "Anatomy of a performance: Sources of musical expression," *Music Perception*, 13(3): 433-453.

Schwarzschild, B. (2004). "Acoustics experiment shows why it is so hard to make out the heroine's words at the opera," *Physiscs Today*, 57(3): 23-25.

Other sources addressed in class

Békésy, G. von (1960). *Experiments in Hearing*. New York: MaGraw-Hill.
[Call #: 612.85 V945]

Berlyne, D. E. (1971). *Aesthetics and Psychobiology*. New York: Appleton-Century-Crofts.

Brunner, J. (1996). *The Culture of Education*. Cambridge: Harvard University Press.
[Call #: 370.15 B894C1996]

Campbell, M. and Greated, C. (1987). *The Musician's Guide to Acoustics*. Oxford: Oxford University Press.
[Call #: 781.1 C189M]

Curtis, H. (1979). *Biology*. New York: Worth Publishers Inc..
[Call #: 574 C978I2 (1977 edition)]

Davies, J. B. (1978). *The Psychology of Music*. Stanford, CA: Stanford University Press.
[Call #: 781.15 D256P]

Deutsch, D. (1995). "Musical Illusions and Paradoxes." Compact Disc. La Jolla, CA: Philomel Records, Inc. http://philomel.com/musical_illusions/oncd2.html

Deutsch, D. (ed.) (1999) (2nd edition). *The Psychology of Music*. San Diego: Academic Press.
[Call #: 781.15 P974D (1st edition, 1982)]

Fechner G. (1860). *Elements of Psychophysics*. Trans. H. E. Adler. D. H. Howes and E. G. Boring, editors. New York: Holt Rinehart & Winston (1966).
[Call #: 152 F291EE]

Fraisse, P. (1982). "Rhythm and Tempo," in *The Psychology of Music* (149-180), D. Deutsch, editor. New York: Academic Press.
[Call #: 781.15 P974D]

Gateway to the Mind (1958). "Hearing." VHS videocassette. New York: Bell Science & J. Warner.

Gorman, A. (1999). "The 'Mozart Effect': Hard science or hype?" Unpublished paper, University of Colorado, Department of Computer Science. http://l3d.cs.colorado.edu/~agorman/pdf/mozart-effect-survey.pdf

Handel, S. (1989). *Listening: An introduction to the Perception of Auditory Events*. Cambridge: The MIT Press.
[Call #: 152.15 H236L]

Helmholtz, H. L. F. (1862/1877/1885). *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (2nd edition). Trans. A. J. Ellis. New York: Dover Publications, Inc. (1954).
[Call #: 781.1 H479L4E2]

Houtsma, A. J. M., Rossing, T. D., and Wagenaars, W. M. (1987). "Auditory Demonstrations." Compact Disc (IPO, NIU, ASA), Eindhoven, Nederlands: Philips Polygram.

Kendall, R, A. and Carterette, E. C. (1996). "Music Perception and Cognition," in *Cognitive Ecology* (87-149), M. P. Friedman and E. C. Carterette editors. San Diego: Academic Press.
[Call #: 153 C676F1996]

Koffka, K. (1935). *Principles of Gestalt Psychology*. New York: W. W. Norton & Co. Inc.

(The) Learning Channel (1994). "Now Hear This," Vol. 5 of *The Body Atlas* set of 6 VHS videocassettes, New York: Pioneer Productions - Ambrose Video Publishing.
[Call #: 611 B668M1994]

Lipscomb S. D. and Kendall, R. A. (1994). "Perceptual judgment of the relationship between musical and visual components in film," *Psychomusicology*, 13(1): 60-98.

Miller, G. A. and Selfridge, J. A. (1950). "Verbal context and the recall of meaningful material," *American Journal of Psychology*, 63:176-185.

Monahan, C. B., Kendall, R. A., and Carterette, E. C. (1987). "The effect of melodic and temporal contour on recognition memory for pitch change," *Perception and Psychophysics*, 41(6): 576-600.

Plomp, R. R. (1976). *Aspects of Tone Sensation*. A Psychophysical Study. London: Academic Press.
[Call #: 612.85 P729A]

Pressnitzer, D. and McAdams, S. (2000). "Acoustics, psychoacoustics, and spectral music," *Contemporary Music Review*, 19(2): 33-59.

Radocy, R. E. and Boyle, J. D. a, J. A. (1997). *Psychological Foundations of Musical Behavior* (3rd edition). Springfield, IL: Charles C. Thomas Publishing. [Call #: 781.11 R131P1997]

Rayleigh, J. W. S. (1896). *The Theory of Sound*, Vols. I&II (2nd edition). New York: Dover Publications, Inc. (1945).
[Call #: 534 R266T21945]

Ricoeur, P. (1991). *A Ricoeur Reader*. M. J. Valdes, editor. Toronto: University of Toronto Press.

Schacter, S. and Singer, J. (1962). "Cognitive, social, and physiological determinants of emotion," *Psychological Review*, 69: 379–99.

Seashore, C. E. (1938). *Psychology of Music*. New York: Dover Publications, Inc. [Call #: 780.1 S439P]

Shannon, C. E. and Weaver, W. (1949). *The Mathematical Theory of Communication*. Urbana: University of Illinois Press.
[Call #: 621.382 S528m1964]

Siegel, J. A. and Siegel, W. (1977). "Categorical perception of tonal intervals: Musicians can't tell sharp from flat," *Perception & Psychophysics*, 21(5): 399-407.

Smith, R. B. (2000). "An interview with Tristan Murail," *Computer Music Journal*, 24(1): 11-19.

Smoorenburg, G. F. (1970). "Pitch perception of two-frequency stimuli," *J. Acoust. Soc. Am.*, 48(4/2): 924-942.

RESOURCES

Writing Resources

• *Sites with information on the APA (American Psychological Association) Style Manual*: Publication manual of the American Psychological Association, 5th ed. (2001). Washington, DC: American Psychological Association. [Library Call# 808.06615 P976a2001] *Several copies available in the Lincoln Park Library reference desk/collection and in the Loop Library stacks*.
http://www.apastyle.org/
http://webster.commnet.edu/apa/index.htm
http://www.uwsp.edu/psych/apa4b.htm
http://owl.english.purdue.edu/handouts/research/r_apa.html
http://www.beadsland.com/weapas/ (Web Extension to the APA Style Manual)

• *Guide for Writing Research Papers Based on Modern Language Association (MLA) Documentation* (Capital Community College, Hartford, Connecticut):
http://webster.commnet.edu/mla/index.shtml

• *DePaul Writing Center* (advice on term-paper writing):
http://condor.depaul.edu/~writing

Other Resources

• *Library*: http://www.lib.depaul.edu

• *ITD* (software training): http://www.itd.depaul.edu/website/students/default.asp

• *Dean of Students Office* (your voice in DePaul):http://studentaffairs.depaul.edu/dos

• *Office of Student Affairs* (academic counseling for international students, students with disabilities, student athletes, etc.): http://studentaffairs.depaul.edu/departments.html

• *Student Support Services* (programs designed to support students from first-generation-university-attendance and low-income families): http://condor.depaul.edu/~sss

CONDUCT

Ethics

• You are expected to abide by the University policies on academic honesty and integrity as outlined in the *Student Handbook* (http://studentaffairs.depaul.edu/handbook/codestudentresponsibility.html).

Violations of these policies will not be tolerated and are subject to sanctions up to and including expulsion from the university. Violations include but are not limited to: cheating, plagiarism, fabrication, falsification or sabotage of research data, destruction or misuse of the university's academic resources, and alteration or falsification of academic records.

• While study groups are encouraged, each student is responsible for completing and submitting his/her own assignments. Separate copies of group-constructed assignments are not acceptable.

• **Be respectful of all class members. Be prepared to accept and offer criticism, to question and be questioned.** Intellectual disagreements and conflicts that do not involve personal attacks are strongly encouraged. They are necessary in order to formulate strong intellectual argumentation skills and improve understanding.

Work Habits

• Pagers/cell-phones must be turned off during class. **Be ready to begin on time.**
• **Attendance is compulsory.** Make sure you obtain class material assigned during an approved absence. Only 2 absence approvals will be granted per student.

TENTATIVE COURSE CALENDAR

WEEK 1

Topics
_ Introductions; expectations; syllabus analysis; Blackboard.
_ Cognitive Psychology of Music and its area of study
_ Philosophy of science
_ Process of empirical investigation
_ A working definition of music

Readings
_ Butler, 1992: *Chapter 1*
_ Kerlinger and Lee, 2000
_ Kastner and Crowder, 1990: *scan through 189-194, 198-200*
_ Schwarzschild, 2004: s*can through the article*
_ Week 1 - online lecture notes

WEEK 2

Topics
_ Physical attributes of acoustic waves
_ Musical instruments as sound-wave generators and transmitters
_ The ear - critical band

Readings
_ Butler, 1992: *Chapter 2 & 3 (up to p. 40)*
_ Johnston, 1989: *Appendix 5*
_ Week 2 - online lecture notes

WEEK 3

Topics
_ Perceptual attributes of acoustic waves - Pitch
Sensory attributes of pitch - I (JND for pitch; pitch scale; pitch theories; pitch relations)
Sensory attributes of pitch - II (the octave; multidimensionality of pitch: pitch height - pitch chroma)
Tuning and temperament
_ Perceptual attributes of acoustic waves - Loudness
_ Perceptual attributes of acoustic waves - Timbre
_ Beating & roughness - consonance / dissonance

Readings
_ Butler, 1992: *Chapters 3 (from p. 40), 4, & 5 (up to p. 84)*
_ Johnston, 1989: *Chapter 1; Appendixes 2-4*
_ Week 3 - online lecture notes

WEEK 4

Topics
_ Perceptual attributes of acoustic waves – Time and Space
_ Physical and perceptual cross-mapping
_ Seashore's model of music and test of musical talent
_ Psychology of learning
Behaviorism (SR chains; classical/operant conditioning)
Neo-Behaviorism (SOR chains)
_ Seashore & Davies: two different takes on the Psychology of Music
Readings
_ Butler, 1992: *Chapter 6*
_ Week 4 - online lecture notes

WEEK 5

Topics
_ Psychology of learning
Cognitivism - Gestalt theory
_ Models of knowing - Implicit and Explicit knowledge
Absolute Pitch - Piaget's Genetic Epistemology - Chromaesthesia
_ Cognitive aspects of pitch in music - I (Gestalt principles / rules)
Readings
_ Butler, 1992: *Chapters 5 (84-87) & 7 (103-110)*
_ Week 5 - online lecture notes

WEEK 6

Topics
_ Mid-term exam
_ Cognitive aspects of pitch in music II
Melody - Contours - Harmony - Pitch groupings
Readings
_ Butler, 1992: *Chapter 7 (110-128)*
_ Week 6 - online lecture notes

WEEK 7

Topics
_ Analytic & synthetic listening
_ Memory limits - Data reduction - Categories
_ Information theory - Musical scales as psychological constructs
_ Cognitive aspects of timbre - Spectral music

Readings
_ Johnston, 1989: *scan through Chapter 9*
_ Butler, 1992: *Chapters 8 & 9 (up to page 148)*
_ Week 7 - online lecture notes

WEEK 8

Topics
_ Focusing attention
_ Accents
_ Model of musical communication
Readings
_ Gabrielsson, 1988: *27-31; 46-48*
_ Kendall and Carterette, 1990: *129-136 (scan through the rest)*
_ Butler, 1992: *Chapter 9: 148-159 (scan through the rest)*
_ Palmer, 1996
_ Week 8 - online lecture notes

WEEKS 9 & 10

Topics
_ Music and productivity, consumption, & emotion
_ Measuring emotion - semantic differential method
_ Musical meaning and emotion
_ Music communication in film
_ Phenomenology of musical experience
Readings
_ Meyer, 1956: *Chapters 1 & 2*
_ Kendall, 2005: *scan through the article*
_ Weeks 9 & 10 - online lecture notes

WEEK 11

Final project due
Final exam