

MATH 110: Mathematics and Music

CD #1: Rhythm

This CD illustrates the importance of rhythm in music by featuring many different styles of music (classical, pop, Cuban, African) as well as many different time signatures (eg. $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$, $\frac{6}{4}$, $\frac{6}{8}$, cut time). Some polyrhythmic music (multiple rhythms played simultaneously) is included as well. As you listen to each piece, try to hear the different time signatures in the music. It is particularly useful to distinguish between similar meters such as $\frac{3}{4}$ versus $\frac{6}{8}$. The music compiled here accompanies the class lectures on rhythm from 1/25, 1/27 and 1/30.

1. John Philip Sousa, *The Stars and Stripes Forever*, 1896. Track 58 on a CD compiled by Wynton Marsalis entitled Music Examples to Accompany Marsalis on Music, Sony Classical. This piece is in cut time (C with a vertical slash through the middle) which is equivalent to a $\frac{2}{2}$ meter. Incidentally, this is the official march of the USA.
2. Pyotr Ilyich Tchaikovsky, *The Nutcracker Suite: Russian Dance*, Op. 71A, 1892. Track 6 from the Fantasia Motion Picture Soundtrack, the Walt Disney Company. This lively dance in $\frac{2}{4}$ time accelerates to a climactic finish. Notice Tchaikovsky's use of the tambourine.
3. Cuarteto Oriente, *Mueve La Cintura Mulata*, Cuban **son** music. Track 8 on the Putumayo CD Afro-Latin, Putumayo World Music, 1998. This features the common Afro-Cuban 3-2 son clave rhythmic pattern discussed in class. The pattern derives from West African music and nearly all Afro-Cuban music (including salsa) centers around this famous clave rhythm. Try and tap out the 3-2 clave rhythm laid down by the claves.
4. Vieja Trova Santiaguera, *Me Dieron La Clave*, Cuban **guaracha**. Track 11 on the Putumayo CD Afro-Latin, Putumayo World Music, 1998. In contrast to the previous piece, the rhythmic underpinning here is the 2-3 clave rhythm. Can you hear the difference?
5. Pyotr Ilyich Tchaikovsky, *The Nutcracker Suite: Waltz of the Flowers*, Op. 71A, 1892. Track 7 from the Fantasia Motion Picture Soundtrack, the Walt Disney Company. This waltz, like most, is in $\frac{3}{4}$ time. To count along, say "one-two-three" along with the "oom-pah-pah" in the lower strings. If you've never been to a performance of this masterful ballet performed live to Tchaikovsky's enchanting music, go see it next holiday season.
6. Billy Joel, *The Piano Man*, 1973. Track 1 on Disc 1 of his Greatest Hits album, Blackwood Music Inc. The $\frac{3}{4}$ meter sometimes finds its way into popular music as it does here with this classic from one of the founders of piano rock. Billy Joel studied classical music at an early age and as a result, much of his music shows a deeper melodic and rhythmic sophistication than most "pop" music.
7. Franz Gruber, *Silent Night* (words by Josef Mohr), 1820. Track 3 on a Windham Hill CD entitled Windham Hill: The Night before Christmas, performed by Barbara Higbie, Sony BMG Music Entertainment. This famous Christmas carol is an excellent example of $\frac{6}{8}$ meter. Note the difference with the two previous pieces in $\frac{3}{4}$ time. Although it is possible to count along with the piece in 3, it is most definitely not a waltz. Music in $\frac{6}{8}$ often has a swaying, singsongy feel to it. The English folk song *Greensleeves* is another popular example of this compound meter.
8. Pyotr Ilyich Tchaikovsky, *Allegro con grazia*, 2nd movement of the Symphony, No. 6, "Pathe-tique", Op. 74, 1893. Track 2 from a Chicago Symphony recording, conducted by Claudio Abbado, CBS Records. The entire second movement of this symphony is in $\frac{5}{4}$ time, a very unusual meter for its day. The five beats of each measure can be broken down into 2 + 3 giving the music its dance-like character.

9. Babatunde Olatunji, *Ajaja*, 1988. Track 1 from a CD entitled Drums of Passion: The Invocation, Rykodisc, 360° Productions. This polyrhythmic African music features an array of performers on various percussion instruments such as the Djembe drum, the Talking drum, the Hoop drum, the Junjun drum and cowbell. Try and distinguish each individual part, noting both its independent motif as well as how it contributes to the entire ensemble. Note that the title of the piece is a palindrome.
10. Phish, *Taste*, 1996. Track 4 from their CD *Billy Breathes, Who is She?* Music, BMI. The fusion rock group Phish draws much of their musical inspiration from jazz, blues and bluegrass. They are known for their live improvisations and free-flowing form. This is an interesting polyrhythmic song that juxtaposes some fairly complex rhythms.
11. Igor Stravinsky, *Le Sacre Du Printemps* (The Rite of Spring), 1913. Track 5 of a recording by the Cleveland Orchestra conducted by Pierre Boulez. This is the first of an amazing two-part piece “Scenes of Pagan Russia.” One of the great orchestral masterpieces of the 20th century, this work features dissonance, polytonality and polyrhythms. The work premiered as a ballet in Paris and the jarring rhythms accompanied with the exotic, sexual dance led to a riot in the theater! Notice the way Stravinsky uses a variety of orchestral sounds to create passion and fury in his music, all the while keeping it rhythmically vibrant through ostinato (repetition of the same note,) multiple meters (at one point he changes from $\frac{5}{4}$ to $\frac{7}{4}$ to $\frac{6}{4}$ in consecutive measures) and polyrhythmic creativity. This is a marvelous piece of music to see performed live by a huge orchestra.