Rhythm: The temporal aspect of music.

Syncopation: A rhythmic figure that stresses a normally weak beat.

Ratio: Two simultaneous rhythmic figures (or meters) consisting of regularly recurring beats that are in proportion to one another, such as 1:1, 1:2, 1:3, 4:3, etc.

Hemiola: Music in which the accentuation scheme or phrasing temporarily suggests a change in meter, without actually inserting a meter change. In its most typical form (found in renaissance and baroque dances), it consists of a metrical pattern in which two bars of simple, triple meter (e.g., 3/4) are articulated as if they were three bars of simple, duple meter (e.g., 2/4). A variation of this would be a bar of compound, duple meter (e.g., 6/8) articulated as if it were a bar of simple, triple meter (e.g., 3/4). Example, showing a typical galliard rhythm:

Symmetrical Meter: A meter based on regular recurring pulses that can be subdivided into groups of two or three (i.e., traditional meters like 2/4, 3/4, 4/4, 6/8, 9/8, etc.)

Asymmetrical Meter: A meter that cannot be divided symmetrically, such as 5/4 or 7/8.

Composite Meter: Another term for **asymmetrical meter**, referring specifically to the way it is subdivided, like $\frac{4+3}{8}$, or $\frac{2+3+3}{8}$, etc.

Mixed Meter: Consecutive, frequently changing meters, e.g., 5/8 | 3/2 | 6/8 | 2/4 |

Displaced Accent: Music in which the normal metric accent pattern implied by the meter is displaced so that accents occur on normally weak beats, or off beats.

Perceived Meter: The metric pattern perceived by the listener.

Additive Rhythm: Rhythm in which unequal metric groupings are added together (e.g., 2+3, 2+3+2, etc.). The term was introduced in *Rhythm and Tempo* (1953), by Curt Sachs. Another, *completely* different definition can be found in: *Handbook For Acoustic Ecology* (1978; Barry Truax, ed.), where 'additive rhythm' is described as *non-metric or free rhythm, where all time intervals are not fractions or multiples of a beat, nor is there any precise regularity of measure or accent. In this situation, each duration simply adds to the others, and so this type of rhythm could be called additive... Additive rhythm is created by randomly occurring events (e.g. the sounds of birds and insects, or the pattern of rain falling).* Kostka & Payne seem to support this second definition when they suggest that additive rhythm creates a lack of perceived meter (6th ed., p. 528), but I suspect most people using the term are referencing the first meaning.

Cross Rhythm (Polyrhythm): Simultaneous presentation of two or more perceivably independent rhythms. E.g., 3 against 2, 4 against 3, 7 against 6, etc.

Polymeter: Two or more simultaneous, perceivably distinct meters in different voices/parts. Although frequently notated with different time signatures in different parts, it is also possible to achieve this with the same notated time signature in all parts, but different implied meters through accentuation and note groupings, including beaming across barlines. Example:

Ametric: No aurally perceivable meter. There may be a time signature in the music (or not), but it is not aurally perceivable due to a lack of regular, recurring pulses.

Metric Modulation (Tempo Modulation): An immediate change in tempo created by equating a particular note value in one bar to a proportionate note value in the next bar. Example:

Added Value Rhythm: Term invented by Messiaen for a procedure in which a note, rest, or dot (often of a 16th-note's length) is added to what would otherwise be a more "square" rhythm in order to disrupt it.

• Example (beginning of "Dance of Fury for Seven Trumpets" from Messiaen *Quartet for the End of Time*):

"Square" Rhythm Version   "Added Value" Version
                                                (notes with "+" over them are added):

becomes

Nonretrogradable Rhythm: Term invented by Messiaen for a rhythm that is the same forwards as backwards (rhythmic palindrome). Any rhythm can become 'nonretrogradable' by appending it to its own retrograde.

Fibonacci Sequence: Numerical series in which each number is the sum of the two previous numbers: 0, 1, 1, 2, 3, 5, 8...

Golden Ratio (Golden Mean, Golden Section, Phi φ): As you go higher in the Fibonacci sequence, dividing any number by its subsequent number will produce a fraction that becomes increasingly closer to .618. The ratio of this fraction to 1 (.618:1) is referred to as the "golden ratio" because it is a proportion found throughout nature, and has been associated with a perfect, proportional balance in art and architecture since its discovery by ancient Greek mathematicians.

☞ Of mathematical interest is that the ratio of the **sum of the quantities** to the **larger quantity** is equal to the ratio of the **larger quantity** to the **smaller one**; thus ($a+b$):b is the same as b:a. Or, put another way, 1.618:1 is the same as 1:.618. Stated as percentages, the ratio would be: 38.2%:.61.8%.

☞ Applications of the Golden Ratio to music are the subject of occasional scholarly debate. For example, the Hungarian theorist Ernö Lendvai wrote a book called, *Béla Bartók: An Analysis of his Music* (1971), in which he argued that the Golden Ratio is found in many Bartok works, but others have since challenged his findings. It can be said with certainty, however, that some composers of the 20th and 21st centuries have consciously used this ratio to subdivide sections of works, and some have used the Fibonacci series to generate rhythms and even pitch collections. Some argue that the Golden Ratio can be found in the proportions of works by Bach, Beethoven, Chopin, and other well-known composers, although I know of no evidence that proves they did so consciously.

Ostinato: A musical pattern (typically rhythmic *and* melodic, but it may be just rhythmic, or just melodic) repeated numerous times in succession. Italian word for 'obstinate.'

Isorhythm: A repeated rhythmic figure in combination with a repeated pitch sequence of a different length. The device dates back to the Middle Ages, where it was often found in the tenor of isorhythmic motets. The repeated rhythmic pattern was called the *talea*, and the repeating pitch sequence was called the *color*.

Polytempo: Simultaneous use of two or more perceivably different *tempi*.

Tempo Canon: a canon in which a given musical line moves at different speeds in two or more voices or instruments. A classic example in Renaissance polyphony is the "Agnus Dei 2" of Josquin's *Missa l'homme armé* (1502), in which the lowest voice moves twice as fast as the middle voice and the top voice moves three times as fast. More modern examples are found in the studies for player piano by Conlon Nancarrow (1912-1997), such as No. 19 (ca. 1948-1960; tempo ratios: 12:15:20), or No. 32 (ca. 1965-69; tempo ratios: 5:6:7:8). Study No. 22 is an acceleration canon in which one voice speeds up at 1% per note, another at 1.5%, and so on; it is also a near palindrome (ca. 1948-1960; tempo ratios: 1%/1.5%/2.25%).

Mechanical Rhythm: rhythm requiring a machine for precise execution due to its complexity. Much of Nancarrow's music was designed for mechanistic playback (as in the player piano studies), and, as a result, achieves a complexity that is beyond the capabilities of human performance.