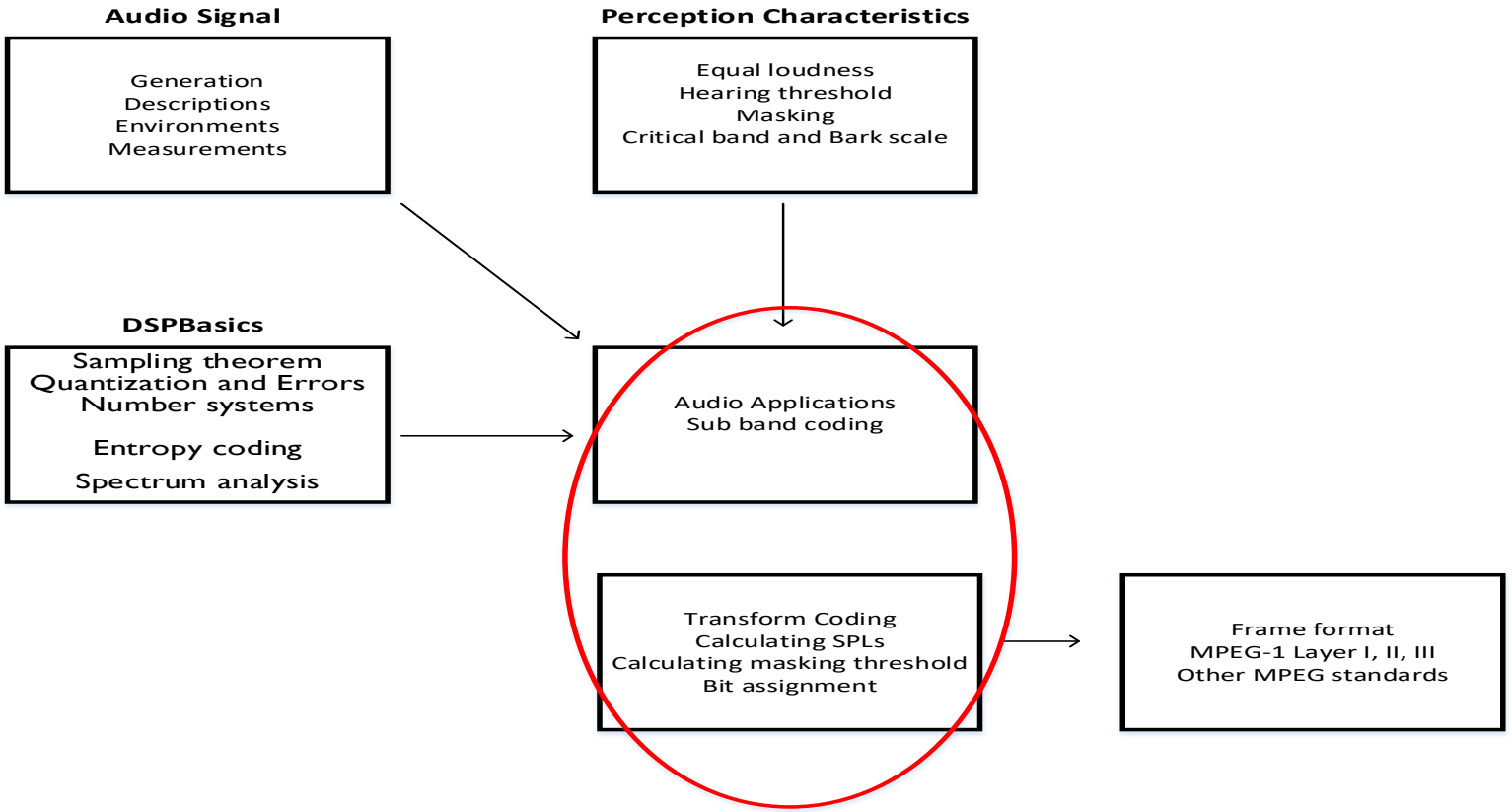
Revisions for Exam



This figure shows the relationships among the topics discussed in the six weeks.

- **Concept understanding** is the most important
  - Terminologies: meaning and their use in audio coding
  - Concepts: definitions and understanding,
  - Operations: these main processes used for audio signals
    - **Example :**
      - ✓ Why Bark scale, definition and its use in computing the masking threshold
      - ✓ Perfect reconstruction, meaning, conditions and how is achieved in the time domain for filter banks and in the frequency domail with MDCT.

- Equations
  - No need to remember complex equations.
  - No complex numerical computation.
  - Simple ones used for definition of terminologies and concepts should be well understood and remembered.
    - For example, frequency resolution, Fs/N .

The above applicable for the all the teaching materials.

Week 1

- Principle of sound propagation in open or closed space.
- Different definitions of sound measurements, for example RT60
- Simple calculation of multiple sound source effects

- General understanding the property of human hearing system

Week 2

- Full understanding the sampling theorem
- Sufficient understanding on quantization, fixed or floating point number systems and the use of scaling in the coding process.
- Sufficient understanding the principle, and be able to perform Huffman coding, process and performance evaluation
- Sufficient understanding on the frequency analysis by discrete Fourier transform and its use
- Sufficient understanding the function of window on the data segment and its effects on spectrum analysis
- No calculation of SPL.

Week 3

Sub-band coding - sufficient understanding on:

- The use of filter bank to divide the signal band into smaller ones
- Why perfect reconstruction is needed and its condition for the filters
- Details of decimation and interpolation are not needed.

Week 4

Transform coding - sufficient understanding on:

- Issues of using different windows and window selection
- Window switching and perfect reconstruction
- No tedious calculations and more conceptual understanding
- Why window switching and how the window switching is performed
- The MDCT and its use in audio coding

Week 5

- Concepts related to masking such as CB, global masking threshold, Bark scale.
- The concept of spreading function and its characteristics
- Knowing the main steps of calculating the global masking threshold. Should know how to do instead of doing it.
- Definitions of SMR, MNR, and concept of bit allocation

Able to provide descriptive answer if questions are asked.

- No need to remember complex equations.

Week 6

- The main differences between MPEG-1 layer I, II and III.
- Bit allocation routine and the use of scaling factor
- General awareness of frame format
- Concept of bit reservoir in MPEG-1 layer III and support of variable bit rate operation

Materials after lecture notes page 215 is not examed.

Revision materials:

- The lecture notes and the given questions. It is adised to CAREFULLY read through the lecture notes for a few times to get sufficient understanding of the subject.

Exam Questions

- 2.5 questions from this parts
- Mainly the concepts of coding process.
- May need simple calculations
- Most questions are the ***descriptive*** types

During Exam:

- Read carefully to fully understand the questions
- Try to provide answers as much as possible
- May ask any questions

Assignment

- Strict deadline
- Prefer to be typed although good hand writing is acceptable
- Your submission will not be returned

The assignment is served to link the topics learnt in the lecture notes for better understanding of the subject.

May try two past year exam papers to see the difficulty level and the stype of the questions. Doing questions for many past year paper is NOT advised.

For a face-to-face discussion, please send an email to egbi@ntu.edu.sg for appointment.

You may also send an email for questions.

Wish you all have excellent exam results !