Reading instructions & hints for learning as per lecture (Stefan Seipel)

Lecture on Perceptual Aspects
While some basic knowledge about perceptual limitations of the human visual system is fundamental to the creation of efficient visualizations, it is surprisingly little written about this in textbooks on scientific/information visualization. There exists an excellent book dedicated to perceptually guided design by Colin Ware, but it is beyond the scope of this course to cover these aspects in full depth, nor is it expected to read this book.

As part of this course, this lecture attempted to draw up some of the most important concepts/knowledge in visual perception, and here you mainly primarily on the content of the lecture slides, meaning that you can answer questions related to this topic on a general and merely superficial level (i.e. knowing facts and definitions from the slides).


Relevant for the exam are all aspects covered in the lecture, except of opponent process theory, slide 43

Lecture on Rendering Techniques
(The slides refer mainly to chapter 7 in the VTK handbook), but the lecture content is also largely described in the book “Data Visualization – Principles and Practices” by Alexandru Telea. More specifically, the lecture content relates to the book chapters as follows:

Slides 1-7: Transparency and alpha blending explained in chapter 2.5 with an emphasis on using OpenGL. The lecture slides were more intended to explain the concept on a general level using specific example.

Slides 8-12: Texture mapping is described in chapter 2.3 but the slides also illustrate the concept of stenciled/alpha textures for visualizing irregular structures.

Slides 13-20: The slides illustrate the use of 2D textures in volume visualization of 3D data volumes. The concept is in the book more theoretically described as one domain modelling technique in chapter 8.1

Slides 22-59: The slides cover basically entire chapter 10. What is not described in the book but on the slides is “splatting” and the corresponding filtering (slides 42-48), as well as performance optimized volume rendering using hierarchical data structures (octrees).

Relevant for the exam are all aspects covered in the lecture (all slides plus related reading in the book).
Lecture on Stereoscopic Rendering
The theory behind and techniques for stereographic rendering are becoming more relevant as more and more stereo-capable displays penetrate the market. This subject is also typically not written about in most visualization textbooks, and therefore you have to go ahead with the slides.

For the exam I would delimit relevant content to slides 4-19.

So what I expect you to know is e.g. the following:

- Terminology: homologous points, stereopsis, retinal disparity, stereo parallax, positive and negative parallax, accommodation, convergence
- Accommodation-convergence conflict, how does it occur?