Project-oriented Software Lab

Course Description
The main task of this software lab is to engage deeply with applications related (but not limited) to fluid mechanics. Thus, the modeling, the numerical simulation with Finite Element (FE) software and the presentation and interpretation of the results have to be accomplished. The lab is open to problems, suggested by the students, which are modeled with partial differential equations.

Participants will work in groups of two on two projects. The first introductory project runs from April 16 until May 24, and the second more advanced project from May 28 until July 19.

Reading
You may find these books helpful. Some of them are also available in German.


Times and Places
The course will take place every Tuesday and Friday between 09:45–11:15 a.m. First session being on April 16 2013 and last session being on July 19 2013. The lecture hall is the computer lab A.U.10 in the Technologiefabrik.

-Please turn over!-
Please try and attend the following *mandatory* sessions punctually:

Tue. 16.04.2013  Organizational issues & Introduction to the FE Method  
Fri. 19.04.2013  Introduction to FEM (part 2) and HiFlow³  
Tue. 23.04.2013  Team Building & Start of project 1  
Fri. 24.05.2013  Project 1: presentations  
Tue. 18.06.2013  Q&A Session  
Tue. 09.07.2013  Project 2: presentations  
Fri. 12.07.2013  Project 2: presentations

**Requirements** for obtaining a tutorial certificate ("Praktikumsschein"):

- Mandatory presence at the dates listed above
- Successful completion of the two projects. For each project, you will have to give a short presentation (5–10 min). For the second project you will have to additionally:
  
  (a) Hand in a report describing your solutions to the exercises, including:
      
      (i) Mathematical problem formulation
      
      (ii) Reasoning supported by analytical derivations
      
      (iii) Plots and tables of computed solutions and other data

  (b) Hand in your source code, extensively commented

The report should be written with \LaTeX, using the provided template. The report, code and presentation can be in English or German. Submission deadline is:

**Fri July 19 2013 11:15 a.m.**

**Materials distribution and communication**
During the semester all needed materials, e.g. report templates, will be published on the course homepage:

http://www.emcl.kit.edu/336_software_lab.php

You can reach the course advisors or all participants plus course advisors via

sl-orga-st2013@lists.kit.edu,  sl-st2013@lists.kit.edu,

respectively.