

科目名 Course Title	計算流体工学特論 [Computational Fluid Dynamics]		
講義題目 Subtitle			
責任教員 Instructor	坪倉 誠 [Makoto TSUBOKURA] (大学院工学研究院)		
担当教員 Other Instructors	大島 伸行		
開講年度 Year	2013	時間割番号 Course Number	092097
開講学期 Semester	2学期	単位数 Number of Credits	2
補足事項 Other Information			
キーワード Key Words	Computational fluid mechanics, Turbulence models, Numerical Simulation		
授業の目標 Course Objectives	This course offers advanced topics on computational fluid mechanics. We will concentrate into numerical models and methods of fluid flows, especially for turbulence as most important and latest research topics in fluid flow problems of not only mechanical engineering and other fields of science. Fundamental theories and engineering applications of fluid flow, turbulence modeling and their numerical simulation methods are investigated. Quality of flow simulation (accuracy and reliability of prediction) is also discussed for applying to engineering problems.		
到達目標 Course Goals			
授業計画 Course Schedule	Lecture 1 Introduction Lecture 2-4 Theory of Turbulence —Fundamentals / Reynolds Average Eq. / Scaling of turbulence Lecture 5-8 Turbulence models —Reynolds Averaged Navier–Stokes (RANS) models / Large Eddy Simulation(LES) Lecture 9-12 Numerical methods of flow simulation —Numerical Schemes / Algorithms / Error analysis / Boundary condition Lecture 13-15 Application to Engineering Problems —Topics on Engineering / Quality of flow simulation		
準備学習（予習・復習）等の内容と分量 Homework			
成績評価の基準と方法 Grading System	Based on class participation (50%), and report results (50%)		
テキスト・教科書 Textbooks	Not required, but the following textbooks will help to understand this course in detail. — “A first course in Turbulence” H.Tennekes & J.L.Lumley, MIT press. (for lecture 1-8) — “Computational Methods for Fluid Dynamics” by J.H.Ferziger & M.Peric, Springer-Verlag (for lecture 9-15)		
講義指定図書 Reading List			
参照ホームページ Websites			
研究室のホームページ Website of Laboratory			
備考 Additional Information	Handouts are distributed to students or presented by ppt file.		