1. Term and Section
Term: Fall term (September 4th – December 3rd, 2014)
Section: A01
CRN: 11001

2. Relevant Courses
Students who plan to take this course are encouraged to take ME 7410: Theory of Turbulence first or in the same time.

3. Instructor Information
Instructor: Dr. Bing-Chen Wang
Office: E1-488
Email: BingChen.Wang@ad.umanitoba.ca
Tel: (204) 474-9305
Fax: (204) 275-7507

4. Lecture Hours and Classroom
Tuesday & Thursday afternoons: 2:00–4:00PM. 3 credit hours.
Classroom: Room 346, Education building.

5. Office Hours
MWF afternoons: 1:00–2:20PM.
In order to receive individual guidance, a student is encouraged to visit the instructor in his office to discuss the subjects of study on a regular base.

6. Objective
The objective of this course is to provide students with a solid grounding in the classical and modern theories of convective heat and fluid flows, centered on the analytical and numerical solutions of the Navier-Stokes and thermal energy equations. The emphasis is on both the laminar and turbulent boundary-layer heat and fluid flows. It is expected that the students are challenged in terms of their understanding of the physical mechanisms, their related mathematical skills, and most importantly, their passion for studying thermal-fluid science and engineering.

7. Evaluation Method
The performance of a student will be evaluated based on their assignments, a research report and presentation, and mid-term and final examinations. Specifically, the mark distribution follows:
Assignments: 20%
Final exam: 80%
8. Class Discussion
In order to help the student to build a deeper insight into the physical problem and also to create a dynamic teaching–learning environment, some carefully-designed questions to the students will be included in the class. Students are encouraged to participate in class discussions by volunteering answers, even though their answers may be incorrect sometimes.

9. Assignments and Presentation
The course will involve perhaps 6 assignments. The purpose of the assignments is not to obtain the answer but “practise” a solution methodology and theory. Assignment solutions should be complete, concise and elegant.

10. Policy on Late Submission of Assignments and Research Report
A deduction of 10% of the mark per day will be applied.

11. Academic Integrity and Respectful Teaching–Learning Environment
Academic integrity and a respectful teaching–learning environment will be maintained in this class following the general policy stated in the University Graduate Calendar.

12. Reference Books
It is strongly recommended that a student has a convenient access to the following textbook:
Other frequently used reference books include:

13. How to Succeed in this Course
- Attend all lectures and tutorials;
- Take lecture notes;
- Participate in class discussions;
- Bring the textbook to the class;
- Keep up to date with the course material: after each lecture;
- Review and expend the lecture notes;
- Read the related material from the textbook and reference books;
- Solve the assigned problems and submit the assignments on time;
- Consult the instructor regarding difficulties in understanding the course material and procedure;
- Work carefully and diligently on the assigned research project;
- Show professionalism when presenting the research report;
- Be self-motivated and be passionate about the thermal-fluid science and engineering.
14. Course Coverage Outline

[1] Introduction;
[5] Laminar Internal Flow: Momentum Transfer;