

***ME6204 Convective Heat Transfer***  
***Part 1: Prof. A.S. Mujumdar***  
***Grading Scheme and Term Paper Criteria***

1. Evaluation

30% for term paper and 70% for Final Open Book examination on April 24<sup>th</sup> 2006

2 Term Paper requirements

A term paper not exceeding 16 pages (all inclusive, 12-pt font, 1.5 spacing) must be submitted by March 2, 2006 in hard copy and soft copy formats. Please retain copies for your records as these reports will not be returned.

The subject of the term paper must not be purely descriptive. It may be any topic in convective heat transfer (single phase, two-phase, Newtonian/ non-Newtonian fluids, analytical or numerical, design or analysis etc). Choose a rather narrow topic of your interest, conduct a literature search to make the final selection after a study of the relevant literature.

Your paper must not be based on just one reference. Do cite ALL references/ websites actually referred to. Omissions will result in penalty in grading.

Please submit a hard copy and a soft copy (WORD only) on CD. It will not be returned.

A number of suitable topics are listed below. Many are rather broad so there are opportunities to consider special cases for your term papers. In view of the number of students in the class and the time available for you to work on this assignment, the term paper maybe submitted by groups of two. Each member will receive the same mark for this assignment. Note that I may ask questions regarding your written report by e-mail and expect a response within 24 hours. The response will be evaluated while grading your paper. Be sure to know well what you write in your paper! **PLEASE WRITE YOUR E-MAIL ID ON THE FRONT COVER OF YOUR PAPER.**

***Suggested topics:***

***Some of the areas are very broad.*** Select a specific sub-topic for your paper.

- Nanofluids heat transfer (in tubes, free convection, conductivity models for nano-fluids etc)
- Impinging jet heat transfer (any sub-topic e.g. micro-jets, supersonic jets, laminar pulsed jets, multiple jets, high temperature jets etc)
- Natural convection ( wavy surfaces, nonNewtonian fluids, mixed convection, porous media tc)
- Similarity solutions ( nonNewtonian fluids, free convection etc)
- Laminar flow in complex geometry ducts
- Pulse combustion (choose a specific topic)
- Bio-heat transfer ( choose a specific topic)
- Enhanced heat transfer( ditto)
- Heat transfer to complex shaped bodies (external flows)
- Turbulent flow in ducts ( tubes, channels, complex geometries)
- Convective cooling of micro-electronics
- Heat transfer in multi-tube exchangers
- CFD solutions of various engineering problems (those with familiarity with Fluent, FEMLAB etc may choose this topic)
- Heat transfer in drying of solids
- Free convective heat and mass transfer
- Scaling/dimensional analysis of selected problems
- Multi-scale modeling
  
- Etc etc

You may make your own selection. The above list is for guidance only.

Prof. A S Mujumdar

January 2006