Kingdom of Saudi Arabia Ministry of Higher Education **Qassim University** College of Engineering		المملكة العربية السعودية وزارة التعليم العالي **جامعة القصيم** **كليه الهندسه**

Selected Topics in Mechanical Power Engineering

College: *Engineering*

Department: *Mechanical Engineering*

First: Course Definition

1- Course Code: *ME 670*

2- Units: 3 credit hrs

3- Semester:

4- Prerequisite

5- Co-requisite:

6- Location (if not on main Campus):

Second: Course Objectives

- *To cover advanced topics related to mechanical Engineering -- Thermal engineering systems*
- *To work on advancement in energy conversion.*
- *To use state of the art techniques and methodologies, and search appropriate topics for further research.*

Third: Course Specifications

1- Topics to be covered:

Subject	No of Weeks	Units
-Current developments in Mechanical Engineering	*2*	*6*
-Refrigeration principle and design	*2*	*6*
-Wind energy engineering	*2*	*6*
-HVAC	*2*	*6*
-Solar power system	*2*	*6*
-Combustion engine design	*2*	*6*
-Turbomachinery components design	2	*6*

-Thermal system design	*1*	*3*

2- Course components (Total hrs in the Semester)

Lecture	Exercise or lab	Total
45	----	45

3- Intended Learning Outcomes of the Course (ILO's) :

a. *Knowledge:*

-To be able to learn the latest techniques related to energy and conversion of energy.
-to be able to work and analyse problems in thermal engineering systems.

ii) Teaching strategies to be used to develop that knowledge:

-Group discussion to assess communication abilities
-Seminars
-Projects presented by students

iii) Methods of assessment of knowledge acquired:

-Projects on related topics
-Homework assignments
-Mid term exam
-Final term exam

b- Cognitive (Intellectual) Skills:

i) Cognitive skills to be developed:

-To acquire ability to analyze and solve mathematically problems.
-to understand modelisation and its implementation.

ii) Teaching strategies to be used to develop these cognitive skills:

-Discussion in class .
-Homework assignments.

iii) Methods of assessment of students' cognitive skills:

-Their written Reports.
-examinations (quizzes, mid term and final exams).
-Case study reports

c. Interpersonal Skills and Responsibility:

i) Description of the interpersonal skills and capacity to carry responsibility to be developed:

-Team work.

-Ideas development and shearing with others (communication skills)

ii) Teaching strategies to be used to develop these skills:

-Mini projects.

-Case study analysis.

-Homework assignment

iii) Methods of assessment of students' interpersonal skills and capacity to carry responsibility:

-Mini projects.

-Written reports.

-Students' seminars and presentations.

d. Communication, Information Technology and Numerical Skills:

i) Description of the skills to be developed in this domain:

-Modelisation and simulation of problems.

-Writing of good technical reports.

ii) Teaching strategies to be used to develop these skills:

-Case study analysis.

-Mini projects.

iii) Methods of assessment of students numerical and communication skills:

-Mini projects.

-Homework assignments.

-Students' seminars and presentations.

e. Psychomotor (if applicable) & Other Non-cognitive Skills :

i) Description of the psychomotor or other skills to be developed and the level of performance required:

- *No*

ii) Teaching strategies to be used to develop these skills :-

- No

iii) Methods of assessment of student's psychomotor skills:

- *No*

4- Student Assessment Schedule:

Serial	*Assessment tool (test, group project, examination etc.)*	*Week due*	*Weight*
1	*First Project – case study*	*Week 3*	*10 %*
2	***Mid Term Exam***	*Week 8-9*	*20 %*
3	*Second Term Project – case study*	*Week 10*	*10 %*
4	*Third Term Project – case study*	*Week 13*	*10 %*
5	***Final Exam***	*Week 16*	*50 %*

5- Student Support:

- *Providing electronic library of textbooks and scientific periodicals.*
- *Providing computer applications for the course.*

6- Learning Resources:

i) Essential Books (References):

-Incropera, DeWitt, Bergman, and Lavine Jone, Fundamentals of Heat and Mass Transfer, Wiley & Sons, 2005.

-John H. Lienhard IV and John H. Lienhard V. `A Heat Transfer Textbook`, 4th edition, Phlogiston Press, USA, 2011, lienhard@mit.edu

ii) Course Notes:

-Dispatched during lectures

iii) Recommended Books

- *Frank K. and Mark S. B., Principles of Heat Transfer, Harper & Row Publishers, New York, 1993.*
- *H. Schlichting, Boundary Layer Theory, 7th Ed., McGraw-Hill Company, 1979.*

iv) Electronic Books & Web Sites:

www.ecs.umass.edu/mie/faculty/rothstein/mie606_fall02.pdf
www.thermalfluidscentral.org/e-books/book-intro.php?b=37
www.nrel.gov/docs/fy05osti/37083.pdf
books.google.com/books?id=yxMnotbAAz4C&dq=Yuwen...1...
www.engr.sjsu.edu/shabany/advht.html

www.sciencedirect.com/science/bookseries/00652717

v) Periodicals:

-Periodical heat transfer in parallel-plate channel of... | Brown ...
library.brown.edu/find/Summon/Record?id=FETCH-LOGICAL...
-Heat Transfer - IEEE Conferences, Publications, and Resources
technav.ieee.org/tag/2831/heat-transfer
-List of engineering journals and magazines - Wikipedia, the free ...
List of engineering journals and magazines. From Wikipedia, the free ... Mechanical engineering. 4.1 Heat Transfer, Fluid Flow and Energy; 4.2 Solid Mechanics ...
en.wikipedia.org/wiki/List_of_engineering_journals_and_magazines
-Amazon.ca: Periodicals - Heat Transfer / Aerospace / Engineering
www.amazon.ca/periodicals-Heat-Transfer.../s?...Periodicals...n%3A387206011%2Ck%3APeriodicals...
-Holdings: Heat transfer engineering.
https://ifind.swan.ac.uk/discover/Record/367780
-Periodical heat transfer
kisi.deu.edu.tr/aytunc.erek/Proje2011/konu9.pdf
-Journal of Heat Transfer - ASME
www.asme.org/products/journals/journal-of-heat-transfer

7- Course Evaluation and Improvement Processes:

i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

-Student`s assessment of course and instructor
-Questioners to be filled by instructor and students

ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department:

-External assessment
-Seminars on topics related to the course
-Through course file

iii) Processes for Improvement of Teaching:

-Inviting professors to give seminars on related topics
-External assessments on course and students` results

iv) Processes for verifying standards of student achievement:

-Through assessment of course file
-External instructor
-Through samples of students` results (exams)

***v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement*.:**

-Through a committee of evaluation in checking the outcomes.

-Through the students` assessment for continuous improvement process.