

## Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	HEAT PIPE SCIENCE AND TECHNOLOGY	Instructor	KANG SHUNG-WEN
Course Class	TEBXD1A DOCTORAL PROGRAM, DEPARTMENT OF MECHANICAL AND ELECTRO-MECHANICAL ENGINEERING, 1A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Selective</li> <li>◆ One Semester</li> </ul>
Relevance to SDGs	SDG4 Quality education SDG11 Sustainable cities and communities		
<b>Departmental Aim of Education</b>			
I. To prepare students who have a comprehensive understanding of the principles of applied sciences and engineering to be innovators in the field of mechanical and electromechanical engineering. II. To train emerging professionals who possess a high level of expertise and ethical standards who will become independent research and development leaders in the industry. III. To motivate students who will pursue continuing education as a means to stay on the cutting edge of global competitiveness and meet changes in their careers and the workplace with confidence and ease.			
<b>Subject Departmental core competences</b>			
A. Head: Knowledge of mechanical and electromechanical engineering.(ratio:40.00) B. Hand: Hands-on skills and practical realization.(ratio:20.00) C. Heart: Love of learning and innovation.(ratio:20.00) D. Eye: Vision of progress and improvements.(ratio:20.00)			
<b>Subject Schoolwide essential virtues</b>			
1. A global perspective. (ratio:20.00) 2. Information literacy. (ratio:20.00) 3. A vision for the future. (ratio:10.00) 4. Moral integrity. (ratio:5.00) 5. Independent thinking. (ratio:30.00) 6. A cheerful attitude and healthy lifestyle. (ratio:5.00) 7. A spirit of teamwork and dedication. (ratio:5.00) 8. A sense of aesthetic appreciation. (ratio:5.00)			

Course Introduction	The course includes the following:heat pipe Structure, design and construction, basic principle and theory, heat transfer capacity, origins and research in the world, application and limitations.
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**The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.**

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

- I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.
- II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.
- III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods
1	After this lesson, students should be able to discuss the following things about heat pipe: Basic components, Advantages, Ideal thermodynamic cycle, Applications, Types, Heat transfer limitations, Resistance network,Wick design, Choosing the working fluid, Container design, Heat pipes in electronics cooling, Current research in electronics cooling.	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCD	12345678	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)

**Course Schedule**

Week	Date	Course Contents	Note
1	113/02/19~ 113/02/25	INTRODUCTION	
2	113/02/26~ 113/03/03	Historical development	

3	113/03/04 ~ 113/03/10	Heat transfer and fluid flow theory (I)	
4	113/03/11 ~ 113/03/17	Heat transfer and fluid flow theory (II)	
5	113/03/18 ~ 113/03/24	Heat pipe components and materials	
6	113/03/25 ~ 113/03/31	Teaching administration observation day	
7	113/04/01 ~ 113/04/07	Extra Day Off For Tomb Sweeping Day	
8	113/04/08 ~ 113/04/14	Design guide(I)	
9	113/04/15 ~ 113/04/21	Design guide(II)	
10	113/04/22 ~ 113/04/28	Midterm test	
11	113/04/29 ~ 113/05/05	Heat pipe manufacture and testing	
12	113/05/06 ~ 113/05/12	Special types of heat pipe(I)	
13	113/05/13 ~ 113/05/19	Special types of heat pipe(II)	
14	113/05/20 ~ 113/05/26	Applications of the heat pipe(I)	
15	113/05/27 ~ 113/06/02	Applications of the heat pipe(II)	
16	113/06/03 ~ 113/06/09	Cooling of electronic components(I)	
17	113/06/10 ~ 113/06/16	Cooling of electronic components(II)	
18	113/06/17 ~ 113/06/23	FINAL TEST	
Key capabilities			
Interdisciplinary			
Distinctive teaching			
Course Content		Green Energy	

Requirement	
Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks Name of teaching materials: Heat Pipes: Theory, Design and Applications; David Reay (Author), Ryan McGlen (Author), Peter Kew (Author)
References	Heat Pipe Science and Technology, Amir Faghri, Taylor and Francis 1995
Grading Policy	<p>◆ Attendance : 30.0 %    ◆ Mark of Usual :        %    ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 40.0 %</p> <p>◆ Other &lt; &gt; :        %</p>
Note	<p>This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a> .</p> <p><b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b></p>