



Sample Brief Course Description	
Course title	Heat Transfer
Course code	PHYS 244
College	Engineering
Department / Program	Engineering/Renewable Energy Engineering
Year/ Level	3/6
Course Type	<p>A.</p> <p><input type="checkbox"/> University</p> <p><input type="checkbox"/> College</p> <p><input type="checkbox"/> Department</p> <p><input checked="" type="checkbox"/> Program</p> <p><input type="checkbox"/> Others</p> <p>b.</p> <p><input checked="" type="checkbox"/> Required</p> <p><input type="checkbox"/> Elective</p>
Credited Hours	3 credit hours
Contact Hours	(LT:2, LB:2 ,TR:0)
Pre-requisites (if any)	PHYS 243
Co-requisites (if any)	None
Course description	This course is an introduction to the principal concepts and methods of heat transfer. It will cover topics on basic modes of heat transfer, conservation of energy, Fourier's law, heat conduction, conduction processes, thermal resistance, fins, heat equation and lumped capacitance, convection heat transfer, flow



	<p>and thermal boundary layers, including laminar and turbulent boundary layers, thermal radiation, blackbody radiation, including Stefan-Boltzmann law, basic concepts of heat exchangers.</p> <p>The laboratory part of this course provides practical-based learning of the following: Determination of thermal conductivity in solids (linear conduction) and determination thermal conductivity of radial system, determination of stefan boltzmann constant, measurement of solar thermal radiation, heat exchangers types and performance, determination of nusselt number, velocity and pressure profile through heat exchangers and pipes, relations between reynolds numbers and prandtels numbers.</p>
<p>Course Main Objectives</p>	<p>After successful completion of this class, the students will be able to: 1.Explain the basic modes of heat transfer, 2. Obtain the differential equation of heat conduction in various coordinate systems, 3. Describe the basic concept of fins and fins performance 4. Analyze problems involving steady and unsteady heat conductions , 5. Recognize basic convection heat transfer coefficient correlations for internal and external flow, forced and natural convection heat transfer, 6. Derive the convection heat transfer equations based on mass, momentum, and energy balances, 7. Describe the temperature distribution through different types of heat exchangers, 8- Perform a general energy analysis on heat exchangers, 9- Estimate different radiation properties associated with heat transfer.</p>
<p>Learning Outcomes</p>	<p>Knowledge and Understanding To understand the basic principles required for understanding conduction, radiation and convection heat transfer.</p> <p>Skills: to apply the basic principles of heat transfer to engineering problems in power systems.</p> <p>Values: to integrate their awareness of the different heat transfer methods into the engineering designs of renewable energy systems.</p>

References:

https://eng.ucmerced.edu/abet/courses/2020_30_ENGR135-01/syllabus

<https://ocw.mit.edu/courses/2-051-introduction-to-heat-transfer-fall-2015/pages/syllabus/>

<https://mme.wsu.edu/documents/2017/02/me-304-syllabus.pdf/>



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محرم 1441 هـ

<http://www.kfupm.edu.sa/departments/me/SiteCollectionDocuments/ME%20315-Heat%20Transfer.pdf>

<https://www.taibahu.edu.sa/Pages/AR/DownloadCenter.aspx?SiteId=67101c3c-c3d1-4ae7-8a89-406568834388&FileId=112f5e76-b351-41bf-8eff-452864cba2dc>