



**MODULE HANDBOOK DESCRIPTION**

Module designation	Hydro-Thermal Energy Conversion	
Code	FBA3103	
Semester(s) in which the module is taught	5 / third year	
Person responsible for the module	Abdul Natsir, S.T., M.T.	
Language	Indonesian	
Relation to curriculum	Elective for Electrical Power System Engineering	
Teaching methods	lectures, small group discussion, case base method	
Workload (incl. contact hours, self-study hours)	Contact minutes every week, each week of the 16 weeks/semester: <ul style="list-style-type: none"> <li>• Lectures : 2 x 50 minutes</li> <li>• Exercises and Assignments : 2 x 60 minutes</li> <li>• Private study : 2 x 60 minutes.</li> </ul> Total study hours = 5 hours 40 minutes/week	
Credit points	2 (~ 3.2 ECTS)	
Required and recommended prerequisites for joining the module	Basic Electric Power (FBS2126)	
Module objectives/intended learning outcomes	1. Student are able to analyse the Thermodynamic review, hydro power, coal-fired, gas turbine, diesel engine, geothermal, and nuclear energy conversion, characteristics of hydro power and thermal generation, and generation in the interconnection system.	PLO3
	2. Student are able to design hydro power generation, and thermal power generation	PLO3, PLO4
	3. Student are able to apply hydro power generation and coal-fired (steam) generation	PLO5

Content	<ol style="list-style-type: none"> <li>1. Introduction of hydro-thermal energy conversion</li> <li>2. A Thermodynamics Review</li> <li>3. Hydro power energy conversion</li> <li>4. Thermal energy conversion (coal-fired, gas turbine, combined cycle, diesel engine, geothermal and nuclear energy conversion)</li> <li>5. Characteristics of hydro power and thermal powerplant</li> <li>6. Generation in the interconnection system</li> </ol>
Examination forms	<ul style="list-style-type: none"> <li>- Written case study</li> <li>- Written and oral project study</li> <li>- Essay midterm and final test</li> </ul>
Study and examination requirements	<p>The final grade in the module is composed of ;</p> <ol style="list-style-type: none"> <li>a. Case assessment : 25 %</li> <li>b. Team-Project assessment : 30 %</li> <li>c. Written Midterm assessment : 20%</li> <li>d. Written Final assessment : 25%</li> </ol> <p>Students must have a final grade of 65% or higher to pass</p>
Reading list	<ol style="list-style-type: none"> <li>1. M. M. El-Wakil, Powerplant Technology, McGraw-Hill Companies, 1984.</li> <li>2. Harry A. Sorensen, Energy Conversion Systems, John Wiley &amp; Sons, 1983.</li> <li>3. Anthony J. Pansini, Kenneth D. Smalling, Guide to Electric Power Generation, The Fairmont Press Inc., 2002</li> <li>4. Djiteng Marsudi, Electrical Energy Generation, Airlangga Press, 2014.</li> <li>5. J. G. Brown, Hydro-Electric Engineering Practice, Queen Anne's Lodge, 1957.</li> </ol>