



UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS EDUCATION
PHYSICS STUDY PROGRAM

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Bachelor of Physics

MODULE HANDBOOK

Module name:	Analisis Rangkaian Listrik (Electric Circuits Analysis)
Module level, if applicable:	Bachelor Program
Code:	FSK6309
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	1 th
Module coordinator:	Sumarna, M.Si., M.Eng.
Lecturer(s):	Juli Astono, M.Si., Dr. Pujiyanto, Sumarna, M.Si., M.Eng.
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsary Course
Teaching format / class hours per week during the semester:	150 minutes lectures and 180 minutes structured activities per week.
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes individual work to complete the project per week for 16 weeks.
Credit points:	3
Prerequisites course(s):	-
Course Outcomes	Students completing this course would be able to:

	<p>CO1. memahami cara kerja alat ukur elektrik dasar (voltmeter, ohmmeter, ampere-meter, dan osiloskop) dan menggunakannya dengan terampil,</p> <p>CO2. memahami jenis dan fungsi/kegunaan komponen-komponen elektronik sehingga dapat menggunakan sesuai dengan keperluan,</p> <p>CO3. memahami konsep rangkaian arus searah / DC,</p> <p>CO4. menganalisis rangkaian elektronik fungsional,</p> <p>CO5. memahami konsep rangkaian arus bolak-balik / AC,</p> <p>CO6. mendesain/merancang dan merealisasikan rangkaian elektronik fungsional (proyek).</p>
Content:	<p>Mata kuliah ini membahas tentang (1) pengenalan komponen elektronik (resistor, kapasitor, induktor, diode, transformator, dll.) dan alat ukur elektrik (volt-meter, ohm-meter, ampere-meter, dan CRO/osiloskop), (2) rangkaian arus searah/DC (konsep arus dan tegangan beserta sumbernya, hukum Ohm dan hukum Joule, konfigurasi seri paralel <i>delta-star</i>, hukum Kirchhoff KVL dan KCL, pembagi tegangan/arus dan jembatan Wheatstone), (3) metode analisis rangkaian (<i>mesh/loop</i>/metode Maxwell, <i>node</i>/simpul, Thevenin dan Norton, superposisi), (4) rangkaian arus bolak-balik/AC (tegangan sinusoidal dan sumbernya, nilai rerata dan efektif, faktor daya, impedansi/eksprasi <i>phasor</i>, fungsi eksponensial kompleks, fenomena <i>transient</i>), (5) rangkaian RC, RL, RLC (konfigurasi seri dan parallel, resonansi, dan <i>bandwidth</i>).</p>
Study / exam achievements:	<p>Assessment is carried out at each meeting by observing the progress of understandings and achievements of each student to realize the chosen system and signal. Each student should present his/her progress in every meeting of each week. At the end of semester each student should present the final report and to demonstrate the performance of the realize system and signal project.</p> <p>The final grade will be weighted as follow:</p>

	<table border="1"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO1, CO2, CO3, CO4 and CO5</td> <td>Individual Assignments</td> <td>Presentation of Progress Reports</td> <td>40%</td> </tr> <tr> <td>2</td> <td>CO6</td> <td>The measurement system realized</td> <td>Presentation of Final Report and The Performance of Measurement System Built</td> <td>60%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>					No	CO	Assessment Object	Assessment Technique	Weight	1	CO1, CO2, CO3, CO4 and CO5	Individual Assignments	Presentation of Progress Reports	40%	2	CO6	The measurement system realized	Presentation of Final Report and The Performance of Measurement System Built	60%	Total				100%
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Total				100%																					
Forms of media:	Board, LCD Projector, Laptop/Computer, electronic componens, electronics equipment.																								
Literature:	<ol style="list-style-type: none"> Boylestad, Robert L., 2007, <i>Introductory Circuit Analysis</i>, Eleventh Edition, Upper Saddle River, New Jersey : Pearson Education, Inc. Glisson Jr., Tildon, H., 2011, <i>Introduction to Circuit Analysis and Design</i>, Springer, Raleigh, North Carolina. Robins, Allan H. and Miller, Wilhelm C., 2013, <i>Circuit Analysis : Theory and Practice</i>, Fifth Eddison, E-Book. Alexander, Charles K. dan Sadiku, Mathew N., 2011, <i>Fundamentals Of Electric Circuits</i>, Third Edition, E-Book. 																								

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO1		✓						
CO2		✓						
CO3			✓					
CO4					✓			
CO5					✓			
CO6						✓	✓	

No.	Program Learning Outcome
PLO1	To show personal characters based on social ethics and academic responsibility. Memiliki sikap religius, kemanusiaan, kemandirian, dan tanggung jawab akademik.
PLO2	To master the concepts of classical and modern physics. Menguasai konsep-konsep fisika klasik dan fisika modern secara komprehensif.
PLO3	To be able to use mathematical, computational, and experimental methods in understanding physical concepts. Mampu menggunakan metode matematis, komputasi, dan/atau eksperimen untuk memahami konsep-konsep fisika.
PLO4	To use operational knowledge of physics to carry out research in applied physics. Mampu mengaplikasikan pengetahuan fisika untuk melakukan penelitian dalam bidang fisika terapan.
PLO5	To analyze physical phenomena using mathematical, computational, and experimental methods to obtain mathematical or empirical models of the phenomena. Mampu menghasilkan model matematis atau empiris fenomena fisika berdasarkan metode matematis, komputasi, dan/atau eksperimen.
PLO6	To be able to use instrumentation skills to solve physical problems. Mampu mengaplikasikan keterampilan instrumentasi untuk menyelesaikan masalah fisika.
PLO7	To be able to communicate and disseminate the knowledge and research in the field of physics. Mampu mengomunikasikan dan mendiseminasikan hasil pengetahuan dan penelitian bidang fisika.
PLO8	To be able to collaborate in scientific and social community. Mampu berkolaborasi dalam komunitas akademik, sosial, dan masyarakat .