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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Computational Neuroscience II
Module level, if applicable	Bachelor
Code, if applicable	FIS425065
Subtitle, if applicable	-
Courses, if applicable	Computational Neuroscience II
Semester(s) in which the module is taught	7th (seventh)
Person responsible for the module	Anis Yuniati, M.Si., Ph.D.
Lecturer(s)	Anis Yuniati, M.Si., Ph.D.
Language	Indonesia
Relation to curriculum	elective course in the fourth year (7th semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam
Credit points	3
Requirements according to the examination	Minimum attendance 75% All assignments submitted Attendance on time
Recommended prerequisites	-
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Master the principles and workings of the Brian2 simulator CO 2. Mastering the model building and simulation process related to neural networks using Brian2 simulator CO 3. Create simple programming related to the mechanism of a process that occurs in neural networks
Content	1. Review of Introduction to software and programming languages in the field of neuroscience computing 2. Brian2 Simulator: Introduction and Installation 3. Neuron Modelling 4. Synapse Modelling 5. Principles of the simulation process 6. Physical units, Neuron Models and Groups 7. Equation form and numerical integration process 8. Refractory principle, Addition of synapses and Input Stimulation 9. Running process, recording, computational methods and efficiency 10. Simple model building and paper review

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<table>
<tr><td>Study and examination requirements and forms of examination</td><td>The final mark will be weighted as follows:
<table>
<tr><th>NO</th><th>Assessment methods (components, activities)</th><th>Weight (percentage)</th></tr>
<tr><td>1</td><td>Final Examination</td><td>40%</td></tr>
<tr><td>2</td><td>Mid-Term Examination</td><td>30%</td></tr>
<tr><td>3</td><td>Class Activities : Quiz, Homework, etc.</td><td>30%</td></tr>
</table>
The final assessment is expressed in the form of a letter value converted from a number value with the following categories:
<table>
<tr><th>NO</th><th>Number Value</th><th>Letter Value</th><th>NO</th><th>Number Value</th><th>Letter Value</th></tr>
<tr><td>1</td><td>≥ 95</td><td>A</td><td>7</td><td>65-69.99</td><td>B/C</td></tr>
<tr><td>2</td><td>90-94.99</td><td>A-</td><td>8</td><td>60-64.99</td><td>C+</td></tr>
<tr><td>3</td><td>85-89.99</td><td>A/B</td><td>9</td><td>55-59.99</td><td>C</td></tr>
<tr><td>4</td><td>80-84.99</td><td>B+</td><td>10</td><td>50-54.99</td><td>C-</td></tr>
<tr><td>5</td><td>75-79.99</td><td>B</td><td>11</td><td>55-34.99</td><td>D</td></tr>
<tr><td>6</td><td>70-74.99</td><td>B-</td><td>12</td><td><35</td><td>E</td></tr>
</table></td></tr>
<tr><td>Media employed</td><td>Whiteboard, markers, LCD projector, laser pointer, power point presentation, laptop/PC</td></tr>
<tr><td>Reading list</td><td>1. Fundamentals of Computational Neuroscience, T.Trappenberg, 2nd edition, Oxford University Press
2. Brian2 documentation
3. An Introductory Course in Computational Neuroscience, P.Miller, MIT Press</td></tr>
</table>

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1			√						
CO 2				√					
CO 3						√	√		