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MODULE HANDBOOK

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|---|--|
| Module name | Pattern Recognition |
| Module level | Undergraduate |
| Code | MII-212405 |
| Courses (if applicable) | Pattern Recognition |
| Semester | Fall (even) |
| Contact person | Wahyono, S.Kom., Ph.D. |
| Lecturer | Wahyono, S.Kom., Ph.D. |
| Language | Bahasa Indonesia |
| Relation to curriculum | 1. Undergraduate degree program, elective. 2. International undergraduate program, elective. |
| Type of teaching, contact hours | 1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 30 students. |
| Workload | 1. Lectures: 3 x 50 = 150 minutes (2 hours 30 minutes) per week. 2. Exercises and Assignments: 2 x 60 = 120 minutes (2 hours) per week. 3. Private study: 2 x 60 = 120 minutes (2 hours) per week. |
| Credit points | 3 credit points (sks). |
| Requirements according to the Examination regulations | A student must have attended at least 75% of the lectures to sit in the exams. |
| Recommended prerequisites | Artificial Intelligence; Machine Learning (*) |

| <p>Learning outcomes (course outcomes) and their corresponding PLOs</p> | <p>After completing this module, a student is expected to:</p> <p>CO1 Be able to explain the concept of pattern recognition and data types in pattern recognition.</p> <p>CO2 Be able to explain feature definitions in text data types and feature extraction methods, as well as implement the feature extraction process.</p> <p>CO3 Be able to explain the feature definition of the audio data type and its feature extraction methods, as well as implement the feature extraction process.</p> <p>CO4 Be able to explain the feature definition of the image data type and its feature extraction methods, as well as implement the feature extraction process.</p> <p>CO5 Be able to explain the basic concepts of feature selection, classification, clustering, evaluation, and implement them in pattern recognition.</p> <p>CO6 Be able to implement problems that involve data into a pattern recognition-based system.</p> <table border="1" data-bbox="467 764 1393 1037"> <thead> <tr> <th colspan="2">PLO</th> <th>CO1</th> <th>CO2</th> <th>CO3</th> <th>CO4</th> <th>CO5</th> <th>CO6</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Program Learning Outcome (PLO)</td> <td>PLO1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PLO2</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PLO3</td> <td></td> <td></td> <td>√</td> <td>√</td> <td></td> <td></td> </tr> <tr> <td>PLO4</td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> </tr> <tr> <td>PLO5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | PLO | | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | Program Learning Outcome (PLO) | PLO1 | | | | | | | PLO2 | √ | √ | | | | | PLO3 | | | √ | √ | | | PLO4 | | | | | √ | √ | PLO5 | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------------|------|--|--|--|--|--|--|------|---|---|--|--|--|--|------|--|--|---|---|--|--|------|--|--|--|--|---|---|------|--|--|--|--|--|--|
| PLO | | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Program Learning Outcome (PLO) | PLO1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PLO2 | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PLO3 | | | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PLO4 | | | | | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PLO5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Contents</p> | <p>(a) Pattern recognition concepts and components.</p> <p>(b) Pattern recognition techniques</p> <p>(c) Feature definition and feature extraction methods</p> <p>(d) Feature selection</p> <p>(e) Decision making (identification, clustering, classification and verification) in a case</p> <p>(f) Test method</p> <p>(g) Case Study: Pattern recognition for text data</p> <p>(h) Case Study: Pattern recognition for 1D data</p> <p>(i) Case Study: Pattern recognition for 2D data</p> <p>(j) Trend research (research development) related to pattern recognition.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Study and examination requirements and forms of examination</p> | <p>The evaluation is done in 4 forms, namely:</p> <ol style="list-style-type: none"> Exam, either midterm or final term, Case based individual task Final project Quizzes. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Media employed</p> | <p>LCD, blackboard, and websites.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Assessments and Evaluation | <table border="1"> <thead> <tr> <th>Type</th> <th>Percentage</th> <th>CO1</th> <th>CO2</th> <th>CO3</th> <th>CO4</th> <th>CO5</th> <th>CO6</th> </tr> </thead> <tbody> <tr> <td>Case based task</td> <td>25%</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>-</td> </tr> <tr> <td>Knowledge Check/Quiz</td> <td>10%</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>-</td> </tr> <tr> <td>Final Project</td> <td>25%</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>25</td> </tr> <tr> <td>Mid Term Exam</td> <td>20%</td> <td>5</td> <td>7.5</td> <td>7.5</td> <td></td> <td>-</td> <td>-</td> </tr> <tr> <td>Final Term Exam</td> <td>20%</td> <td>-</td> <td>-</td> <td>-</td> <td>7.5</td> <td>7.5</td> <td>5</td> </tr> <tr> <td>Total</td> <td>100%</td> <td>12</td> <td>14.5</td> <td>14.5</td> <td>14.5</td> <td>14.5</td> <td>30</td> </tr> </tbody> </table> | | | | | | | | Type | Percentage | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | Case based task | 25% | 5 | 5 | 5 | 5 | 5 | - | Knowledge Check/Quiz | 10% | 2 | 2 | 2 | 2 | 2 | - | Final Project | 25% | - | - | - | - | - | 25 | Mid Term Exam | 20% | 5 | 7.5 | 7.5 | | - | - | Final Term Exam | 20% | - | - | - | 7.5 | 7.5 | 5 | Total | 100% | 12 | 14.5 | 14.5 | 14.5 | 14.5 | 30 |
|----------------------------|--|------------|-------------|-------------|-------------|-------------|-----------|-----|------|------------|-----|-----|-----|-----|-----|-----|-----------------|-----|---|---|---|---|---|---|----------------------|-----|---|---|---|---|---|---|---------------|-----|---|---|---|---|---|----|---------------|-----|---|-----|-----|--|---|---|-----------------|-----|---|---|---|-----|-----|---|--------------|-------------|-----------|-------------|-------------|-------------|-------------|-----------|
| | Type | Percentage | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Case based task | 25% | 5 | 5 | 5 | 5 | 5 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Knowledge Check/Quiz | 10% | 2 | 2 | 2 | 2 | 2 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Final Project | 25% | - | - | - | - | - | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Mid Term Exam | 20% | 5 | 7.5 | 7.5 | | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Final Term Exam | 20% | - | - | - | 7.5 | 7.5 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100% | 12 | 14.5 | 14.5 | 14.5 | 14.5 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reading List | <ol style="list-style-type: none"> 1. Pattern Classification (2nd. Edition) by R. O. Duda, P. E. Hart and D. Stork, Wiley 2000. 2. Pattern Recognition and Machine Learning by C. Bishop, Springer 2007 3. Introduction to Pattern Recognition: A Matlab Approach by Sergio Theodoridis and Aggelos Pikrakis, 2006. 4. Pattern Recognition and Neural Network, Brian D. Ripley, 2008. 5. Website for Pattern Recognition course in the Department of Computer Science and Engineering, University of Buffalo, http://www.cedar.buffalo.edu/%7Esrihari/CSE555/Chap1.Part1.pdf 6. Informasi dan sumber data di http://kdd.ics.uci.edu/. 7. R. Jain, R. Kasturi, B.G. Schunck, Machine Vision, Mc Graw-Hill, 1995. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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