

SM234151 - Mathematics

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| Module Name | Mathematics |
| Module level, if applicable | General Knowledge |
| Code, if applicable | SM234151 |
| Subtitle, if applicable | - |
| Course, if applicable | Mathematics |
| Semester(s) in which the module is taught | 2 nd Semester |
| Person responsible for the module | Dr. Tahiyatul Asfihani, S.Si, M.Si |
| Lecturer | Mathematics Lecturer Team |
| Language | Indonesian, English |
| Relation to curriculum | Compulsory Courses for undergraduate program in Urban and Regional Planning |
| Type of teaching, contact hours | M3: Case study Lecture (Face to face lecture): 2.5 hours x 14 weeks 35 hours per semester |
| Workload | Regular (3 SKS) Class: 2.5 hours x 14 weeks = 35 hours Structured activities: 4 hours x 14 weeks = 56 hours Independent Study: 3 hours x 14 weeks = 42 hours Exam: 1.5 hours x 4 time = 6 hours Total = 133 hours |
| Credit points | 3 SKS ~ 4.8 ECTS |
| Requirements according to the examination regulations | Registered in this course Minimum 80% attendance in this course |
| Recommended prerequisites | - |
| Module objectives/intended learning outcomes | General Knowledge: 1. Students are able to identify and explain foundations of mathematics that include pure, applied, and the basic of computing 2. Students are able to solve simple and practical problems by applying basic mathematical |

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| | <p>statements, methods and computations</p> <p>Specific Knowledge:</p> <ol style="list-style-type: none"> 1. Students are able to apply matrix concepts to solve a linear equation system and determine the eigen value 2. Students are able to apply equations or inequalities and also absolute value. 3. Students are able to draw graphs of polynomial functions and transcendent functions. 4. Students are able to define sinus, cosines, tangent, and apply trigonometric equations in simplifying /solving trigonometric equations 5. Students are able to differentiate explicit functions, apply chain rules, derivative implicit functions, and are able to determine maximum/minimum value of the polynomial function 6. Students are able to solve integral using fundamental calculus theorem and basic integration equation 7. Students are able to calculate the area between curves and the volume of area revolution 8. Students are able to understand geometry |
| <p>Content</p> | <ol style="list-style-type: none"> 1. Matrix and determinant, solving linear equation system. 2. Real Number System, logarithms, absolute value, Inequalities, the coordinates planes, line equation. 3. Property and operation functions, polynomial functions, inverse functions, transcendent and trigonometry functions, graph functions. 4. Sinus, cosinus, tangent, cotangent, secan, cosecan, trigonometry equation. 5. Limit functions, continuity, the derivative, applications of derivatives. 6. Improper integral, integration with substitution, partial integration of rational functions, trigonometric functions integration, other integration tehcnique. 7. Application of Integral: The area between curve and the volume of area revolution 8. Application of Integral: The length of a curve and the surface area of rotating objects 9. Cone slice, mirroring, shifting, projection. |

| <p>Study and examination requirements and forms of examination</p> | <p>10 assessments:</p> <table border="1" data-bbox="743 262 1307 1092"> <thead> <tr> <th>Evaluation</th> <th>Method</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Assignment 1 & 2, Quiz 1</td> <td>5%</td> </tr> <tr> <td>2</td> <td>Assignment 3</td> <td>5%</td> </tr> <tr> <td>3</td> <td>Quiz 2</td> <td>10%</td> </tr> <tr> <td>4</td> <td>Assignment 5</td> <td>5%</td> </tr> <tr> <td>5</td> <td>Mid Term Exam</td> <td>25%</td> </tr> <tr> <td>6</td> <td>Assignment 6</td> <td>5%</td> </tr> <tr> <td>7</td> <td>Assignment 7</td> <td>10%</td> </tr> <tr> <td>8</td> <td>Assignment 8, Quiz 3</td> <td>5%</td> </tr> <tr> <td>9</td> <td>Assignment 9 & 10</td> <td>5%</td> </tr> <tr> <td>10</td> <td>Final Exam</td> <td>25%</td> </tr> </tbody> </table> <p>1. <i>Assignment 1 & 2, Quiz 1 - week 1-2</i> 2. <i>Assignment 3 - week 3-4</i> 3. <i>Quiz 2 - week 5</i> 4. <i>Assignment 5 - week 6-7</i> 5. <i>Mid Term Exam - week 8</i> 6. <i>Assignment 6 - week 9-10</i> 7. <i>Assignment 7 - week 11</i> 8. <i>Assignment 8, Quiz 3 - week 12-13</i> 9. <i>Assignment 9 & 10 - week 14-15</i> 10. <i>Final Exam - week 16</i></p> | Evaluation | Method | Weight | 1 | Assignment 1 & 2, Quiz 1 | 5% | 2 | Assignment 3 | 5% | 3 | Quiz 2 | 10% | 4 | Assignment 5 | 5% | 5 | Mid Term Exam | 25% | 6 | Assignment 6 | 5% | 7 | Assignment 7 | 10% | 8 | Assignment 8, Quiz 3 | 5% | 9 | Assignment 9 & 10 | 5% | 10 | Final Exam | 25% |
|---|---|------------|--------|--------|---|--------------------------|----|---|--------------|----|---|--------|-----|---|--------------|----|---|---------------|-----|---|--------------|----|---|--------------|-----|---|----------------------|----|---|-------------------|----|----|------------|-----|
| Evaluation | Method | Weight | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Assignment 1 & 2, Quiz 1 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Assignment 3 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Quiz 2 | 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Assignment 5 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Mid Term Exam | 25% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Assignment 6 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Assignment 7 | 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Assignment 8, Quiz 3 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Assignment 9 & 10 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Final Exam | 25% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Media employed</p> | <p>Classical teaching tools with white board and power point presentation, audiovisual, zoom meeting, ITS online classroom.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Reading list</p> | <p>Main reference:</p> <ol style="list-style-type: none"> Tim Dosen - Matematika ITS, Buku Ajar Matematika I FADP , Edisi ke-1 Departemen Matematika ITS, 2018 Anton, H. dkk, Calculus, 10-th edition, John Wiley & Sons, New York, 2012. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Supporting reference:

1. Kreyzig, E, Advanced Engineering Mathematicss, 10-th edition, John Wiley & Sons, Singapore, 2011.
2. Purcell, J, E, Rigdon, S., E., Calculus, 9-th edition, Prentice-Hall, New Jersey, 2006.
3. James Stewart , Calculus, ed.7, Brooks/cole-Cengage Learning, Canada,2012.