

MODULE HANDBOOK

< Matematika Diskrit >

Discrete mathematics

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|--|---|--------|---|--------|--|--------|--|
| Nama Mata Kuliah | Matematika Diskrit <i>Discrete mathematics</i> | | | | | | |
| Prodi | Sarjana | | | | | | |
| Kode Mata Kuliah | SM234204 | | | | | | |
| Semester | 2 | | | | | | |
| Penanggung Jawab | Drs. Daryono Budi Utomo, M.Si | | | | | | |
| Dosen Pengampu | Drs. Daryono Budi Utomo, M.Si. Drs. Nurul Hidayat, M.Kom Dr. Drs. Bandung Arry Sanjoyo, M.IKomp. Dr. Darmaji, S.Si, MT | | | | | | |
| Bahasa | Bahasa Indonesia | | | | | | |
| Metode Pembelajaran | Metode SCL | | | | | | |
| Beban kerja | 1. Tatap Muka: 3 x 50 = 150 menit per minggu 2. Pembelajaran terstruktur : 3 x 60 = 180 menit per minggu 3. Pembelajaran mandiri: 3 x 60 = 180 menit per minggu. | | | | | | |
| Bobot SKS | 3 sks | | | | | | |
| Syarat mengikuti Ujian | Seorang mahasiswa harus menghadiri setidaknya 80% perkuliahan untuk dapat mengikuti ujian. | | | | | | |
| Mata Kuliah Prasyarat | Logika | | | | | | |
| Capaian Pembelajaran Mata Kuliah (CPMK) | <table border="1"><tr><td>CPMK-1</td><td>Mahasiswa mampu mengidentifikasi dan menjelaskan struktur diskrit untuk mendukung penalaran dengan bukti <i>Students are able to identify and explain discrete structures to support reasoning with evidence</i></td></tr><tr><td>CPMK-2</td><td>Mahasiswa mampu menyelesaikan permasalahan sederhana model struktur diskrit pada dunia nyata dengan menggunakan metode grafis dan numerik. <i>Students are able to solve simple problems of discrete structure models in the real world using graphical and numerical methods</i></td></tr><tr><td>CPMK-3</td><td>Mahasiswa mampu mengembangkan ketrampilan kuantitatif dan penalaran matematis yang diperlukan untuk penyelesaian masalah sederhana dalam ilmu komputer dan matematika terapan. <i>Students are able to develop the quantitative and mathematical reasoning skills needed for solving simple problems in computer science and applied mathematics.</i></td></tr></table> | CPMK-1 | Mahasiswa mampu mengidentifikasi dan menjelaskan struktur diskrit untuk mendukung penalaran dengan bukti <i>Students are able to identify and explain discrete structures to support reasoning with evidence</i> | CPMK-2 | Mahasiswa mampu menyelesaikan permasalahan sederhana model struktur diskrit pada dunia nyata dengan menggunakan metode grafis dan numerik. <i>Students are able to solve simple problems of discrete structure models in the real world using graphical and numerical methods</i> | CPMK-3 | Mahasiswa mampu mengembangkan ketrampilan kuantitatif dan penalaran matematis yang diperlukan untuk penyelesaian masalah sederhana dalam ilmu komputer dan matematika terapan. <i>Students are able to develop the quantitative and mathematical reasoning skills needed for solving simple problems in computer science and applied mathematics.</i> |
| CPMK-1 | Mahasiswa mampu mengidentifikasi dan menjelaskan struktur diskrit untuk mendukung penalaran dengan bukti <i>Students are able to identify and explain discrete structures to support reasoning with evidence</i> | | | | | | |
| CPMK-2 | Mahasiswa mampu menyelesaikan permasalahan sederhana model struktur diskrit pada dunia nyata dengan menggunakan metode grafis dan numerik. <i>Students are able to solve simple problems of discrete structure models in the real world using graphical and numerical methods</i> | | | | | | |
| CPMK-3 | Mahasiswa mampu mengembangkan ketrampilan kuantitatif dan penalaran matematis yang diperlukan untuk penyelesaian masalah sederhana dalam ilmu komputer dan matematika terapan. <i>Students are able to develop the quantitative and mathematical reasoning skills needed for solving simple problems in computer science and applied mathematics.</i> | | | | | | |

| | CPMK-4 | <p>Mahasiswa mampu memahami perubahan dari satu keadaan ke keadaan lain dan menggambarkan dalam bentuk graf.</p> <p><i>Students are able to understand changes from one state to another and describe it in the form of a graph.</i></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|-------|-------|-------|-------|-------|-------|--------|---|---|--|--|--|--------|---|--|---|--|---|--------|---|--|--|---|--|--------|---|--|---|--|--|--------|---|---|--|--|---|
| | CPMK-5 | <p>Mahasiswa mampu memilih metode penyelesaian masalah sederhana pada salah satu bidang analisis, aljabar, pemodelan, optimasi sistem dan ilmu komputasi yang membutuhkan kombinasi beberapa konsep, teknik, dan algoritma yang relevan.</p> <p><i>Students are able to choose simple problem solving methods in one of the areas of analysis, algebra, modeling, system optimization and computational science that require a combination of several relevant concepts, techniques and algorithms</i></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>Matrik CPL – CPMK</p> <table border="1" data-bbox="533 864 1437 1084"> <thead> <tr> <th>CPMK</th> <th>CPL-1</th> <th>CPL-4</th> <th>CPL-5</th> <th>CPL-7</th> <th>CPL-8</th> </tr> </thead> <tbody> <tr> <td>CPMK-1</td> <td>V</td> <td>V</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-2</td> <td>V</td> <td></td> <td>V</td> <td></td> <td>V</td> </tr> <tr> <td>CPMK-3</td> <td>V</td> <td></td> <td></td> <td>V</td> <td></td> </tr> <tr> <td>CPMK-4</td> <td>V</td> <td></td> <td>V</td> <td></td> <td></td> </tr> <tr> <td>CPMK-5</td> <td>V</td> <td>V</td> <td></td> <td></td> <td>V</td> </tr> </tbody> </table> | | CPMK | CPL-1 | CPL-4 | CPL-5 | CPL-7 | CPL-8 | CPMK-1 | V | V | | | | CPMK-2 | V | | V | | V | CPMK-3 | V | | | V | | CPMK-4 | V | | V | | | CPMK-5 | V | V | | | V |
| CPMK | CPL-1 | CPL-4 | CPL-5 | CPL-7 | CPL-8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-1 | V | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-2 | V | | V | | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-3 | V | | | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-4 | V | | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-5 | V | V | | | V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Deskripsi Singkat Mata Kuliah</p> | <p>Matakuliah ini membahas struktur matematika dengan obyek berbentuk diskrit. Topik ini penting untuk matematika murni dan terapan serta memberikan dasar matematika untuk memahami komputasi dengan Komputer. Cakupan materi meliputi Teori Himpunan, Induksi Matematika, Permutasi dan Kombinasi, Relasi dan Fungsi Diskrit, Graf, Pohon dan Finite State Machine. Untuk mengukur kemampuan mahasiswa dilakukan evaluasi berupa kuis, ujian, dan tugas-tugas individu maupun kelompok.</p> <p><i>This course discusses mathematical structures with discrete objects. This topic is important for pure and applied mathematics and provides a mathematical foundation for understanding computing with computers. The material covered includes Set Theory, Mathematical Induction, Permutations and Combinations, Discrete Relations and Functions, Graphs, Trees and Finite State Machines. To measure student abilities, evaluations are carried out in the form of quizzes, exams, and individual and group assignments.</i></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Bahan Kajian: Materi Pembelajaran</p> | <ul style="list-style-type: none"> ● Teori Himpunan / Set Theory ● Induksi Matematika / Mathematics Induction ● Permutasi dan kombinasi /Permutation and combination ● Relasi dan Fungsi /Relations and Functions ● Dasar-dasar teori graf dan pohon /Basics of graph theory and tree ● Finite State Machines /Finite State Machines | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Bobot Penilaian | <ul style="list-style-type: none"> ● Assignment (20%) ● Quiz (20%) ● Mid-term Examination (30%) ● Final Examination (30%) |
| Media Pembelajaran | LCD, whiteboard, websites (myITS Classroom), zoom. |
| Pustaka | <p>Utama :</p> <ol style="list-style-type: none"> 1. Liu, C. L. and DP Mohepatra, "Elements of Discrete Mathematics", 3rd ed., McGraw-Hill Inc., 2008. <p>Pendukung:</p> <ol style="list-style-type: none"> 1. Kenneth H. Rosen, "Discrete Mathematics and Its Applications" 8th ed., McGraw-Hill, 2019 2. Ralph P. Grimaldi, "Discrete and Combinatorial Mathematics" 5th ed, Pearson Addison Wesley, 2004 |