



<b>1. Subject name</b>	<b>Mathematical methods II.</b>				
<b>2. Subject name in Hungarian</b>	Matematikai módszerek II.				
<b>3. Code</b>	<b>BMEKOKAD007</b>	<b>4. Evaluation type</b>	<b>exam grade</b>	<b>5. Credits</b>	<b>4</b>
<b>6. Weekly contact hours</b>	<b>1 (0) Lecture</b>	<b>0 (0) Practice</b>	<b>0 (0) Lab</b>		
<b>7. Curriculum</b>	<b>PhD Programme</b>	<b>8. Role</b>	<b>Basic course</b>		
<b>9. Working hours for fulfilling the requirements of the subject</b>					<b>120</b>
<b>Contact hours</b>	28	<b>Preparation for seminars</b>	28	<b>Homework</b>	12
<b>Reading written materials</b>	16	<b>Midterm preparation</b>	20	<b>Exam preparation</b>	16
<b>10. Department</b>	<b>Department of Control for Transportation and Vehicle Systems</b>				
<b>11. Responsible lecturer</b>	Dr. Péter Tamás				
<b>12. Lecturers</b>	Dr. Péter Tamás				
<b>13. Prerequisites</b>					
<b>14. Description of lectures</b>	<ol style="list-style-type: none"> <li>1. The symbolic calculations. Definition of Computer algebra. Key features of symbolic calculations. The limitations of symbolic calculations. Symbolic and numerical calculations. Mathematical analysis in Maple environment. Graphic applications.</li> <li>2. Modeling of transport systems. Vehicle dynamics modeling. Mathematical modeling of spatial non-linear swing system. Modeling of road transport systems. Modeling large-scale networks. Automating mathematical modeling for large complex systems.</li> <li>3. The notable equations and their applications. Euler equation. Euler-Lagrange equation. The Lagrange's equations of the first kind. The Lagrange's equations of the second kind.</li> <li>4. Designing Optimum Linear Systems. To solve the Riccati equation by Anderson's iteration method. Kalman-Bucy filter by Maple. Design of nonlinear systems. Maple Analysis of Lyapunov Functions</li> </ol>				
<b>15. Description of practices</b>					
<b>16. Description of laboratory practices</b>					
<b>17. Learning outcomes</b>	A. Knowledge B. Skills C. Attitudes D. Autonomy and Responsibility				
<b>18. Requirements, way to determine a grade (obtain a signature)</b>	The credits are obtained by completing the assignment and by passing the oral exam.				
<b>19. Opportunity for repeat/retake and delayed completion</b>					
<b>20. Learning materials</b>					
<b>Effective date</b>	27 November 2019	<b>This Subject Datasheet is valid for</b>	2024/2025 semester II		