

JALIU Codruta  
DIACONESCU Dorin  
NEAGOE Mircea  
CIOBANU Daniela  
SAULESCU Radu



**APPLICATIONS**  
of  
**MECHANISMS ANALYSIS**  
and  
**SYNTHESIS**

©2003 EDITURA UNIVERSITATII TRANSILVANIA BRASOV

Adresa: 2200 Braşov,  
B-dul Eroilor, Nr. 9  
Tel/Fax :0268 - 47 53 48  
E-mail : [repa@unitbv.ro](mailto:repa@unitbv.ro)



Tipărit la:  
Tipografia Universităţii "Transilvania" din Braşov  
B-dul Eroilor 9  
tel/fax: 0268 47 53 48

Toate drepturile rezervate

Editură acreditată de CNCIS  
Adresa nr.1615 din 29 mai 2002

Referenţi ştiinţifici: Prof. dr. ing. Florea DUDIŢĂ  
Conf. dr. ing. Olimpiu MUNTEANU

Descriere CIP a Bibliotecii Naţionale a României  
Applications of mechanisms analysis and synthesis/ Codruţa  
Jaliu, Dorin Diaconescu, Mircea Neagoe, ... - Braşov: Editura  
Universităţii "Transilvania", 2003  
Bibliogr.  
ISBN 973-635-155-6

I. Jaliu, Codruţa  
II. Diaconescu, Dorin  
III. Neagoe, Mircea

62-23

## CONTENTS

INTRODUCTION .....	7
1. STRUCTURAL ANALYSIS OF MONOCONTOUR MECHANISMS .....	9
2. ANALYSIS AND STRUCTURAL OPTIMIZATION OF TWO-LOOP MECHANISMS .....	15
3. STRUCTURAL SYNTHESIS OF COMPLEX MECHANISMS .....	20
4. KINEMATICAL ANALYSIS OF PLANAR BAR MECHANISMS .....	27
5. NUMERICAL SYNTHESIS OF THE CRANK – SLIDER MECHANISM, USED IN MACHINE TOOLS FOR MECHANICAL ENGINEERING AND WOOD INDUSTRY .....	34
6. THE KINEMATICAL ANALYSIS OF CAM MECHANISMS .....	45
7A. COMPUTER AIDED SYNTHESIS OF CAM MECHANISMS, USED IN MACHINE TOOLS AND WOOD INDUSTRY .....	53
7B. COMPUTER AIDED SYNTHESIS OF CAM MECHANISMS, USED IN ROBOTS .....	65
8. IDENTIFICATION OF THE GEOMETRICAL PARAMETERS OF A PLANE INVOLUTE-TOOTH GEAR .....	72
9. GENERATING INVOLUTE TEETH USING THE COUNTERPART RACK .....	75
10. DIRECT GEOMETRICAL SYNTHESIS OF A PLANE INVOLUTE-TOOTH GEAR PAIR .....	79
11. ANALYSIS OF THE DYNAMIC RESPONSE OF A MACHINE MOTOR – GEAR PAIR – PUMP TYPE .....	85
12. STRUCTURAL, KINEMATIC AND STATIC ANALYSIS OF A PLANETARY GEAR .....	90

13. SYNTHESIS OF A CYCLOIDAL CURVE FROM AN ORNAMENT USED IN WOOD INDUSTRY .....	94
APPENDIX	
1. Kinematical Joints Systematization .....	103
2. Structural Analysis of Mechanisms .....	106
3. Cam Mechanisms. Transmission Functions .....	118
4. Terminology. Definitions .....	127
REFERENCES .....	135