

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Bachelor of Technology			Branch/Spec.		Mechatronics Engineering		
Semester		VIII			Version		2.0.0.0		
Effective from Academic Year			2017-18		Effective for the batch Admitted in			July 2014	
Subject code		2MC801		Subject Name		COMPUTATIONAL INTELLIGENCE TECHNIQUES			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	25	25	50
Pre-requisites:									
A student has to understand following subjects before learning these subjects: <ul style="list-style-type: none"> • knowledge Numerical Methods • 2. C/C++ language or MATLAB tool 									
Learning Outcome:									
After successful completion of the course, student will be able to <ul style="list-style-type: none"> • Student understands what optimization is. • Where, which optimization should be utilized. • What is intelligence technique? • 4. How to use intelligence techniques for implement smartness. 									
Theory syllabus									
Unit	Content								Hrs
1	Introduction to Optimization: Introduction , Historical Development, Engineering Applications of Optimization , Statement of an Optimization Problem, Classification of Optimization Problems, Optimization Techniques								5
2	Classical Optimization Techniques: Introduction, Single-Variable Optimization, Multivariable Optimization with No Constraints, Multivariable Optimization with Equality Constraints, Multivariable Optimization with Inequality Constraints								10
3	Expert Systems: An Introduction to Expert System, Explanation Facilities, Expert System Developments Process, knowledge acquisition.								7
4	Fuzzy Logic: Human-like decision making: Definition of fuzzy set, Membership function, Notation of fuzzy set, Operations of fuzzy set, Fuzzy number and operations, Extension principle, Fuzzy rules, De-fuzzification, Fuzzy control								7
5	Artificial Neural Network: An introduction to artificial intelligence and biological neural network, Artificial Neural Networks, Neural programming based on Matlab								8
6	Modern Methods of Optimization: Introduction, Genetic Algorithms, Particle Swarm Optimization, Ant Colony Optimization, Optimization of Fuzzy Systems, Neural-Network-Based Optimization								8
Practical content									
The Practical/term work shall be based on the topics mentioned above and will be defended by the candidates.									

Text Books	
1	S.S. Rao, "Engineering Optimization", New age international publication, 3rd edition.
2	T. J. Ross, "Fuzzy logic with Engineering Application", McGraw-Hill.
3	B. Yeganarayana, "Artificial Neural Network", PHI
Reference Books	
1	J. Arora, "Introduction to Optimum Design"
2	P. Y. Papalambros and D. J. Wilde, "Principles of Optimal Design"
3	Rich and Knight, "Artificial Intelligence", McGraw-Hill.
4	Dukipatti, "Matlab programming"