GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Master of Technology					Branch/Spec.	Biomedical Engineering		
Semester	I					Version	1.0.0.0		
Effective from Academic Year			2018-19			Effective for the batch Admitted in			August 2018
Subject code	3BM102		Subject Name			Statistical Methods for Bio-Engineering			
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	-	1	-	4	Theory	40	60	100
Hours	3	-	2	-	5	Practical	30	20	50

Pre-requisites: Basic statistical Mathematics.

Learning Outcome: The educational objectives of the course are to educate students to attain the following:

- Develop skills of statistical analysis applicable in the field of biomedical research.
- Ability to analyze data through the application of appropriate statistical methods and make appropriate conclusions.
- The course contents will enable the students for the investigative study of biological data and various functions required for Biomedical Engineers.

Theory syllabus

Unit	Content	Hrs
	Introduction to the overview and importance of the course.	
1	**DESCRIPTIVE STATISTICS**: Population and Sample collection, Data and Types of data, Methods of data collections, Data Presentation-Textual, Tabular and Graphical, **Measures of central tendency:** computation of means, median and mode from grouped and ungrouped data. **Measure of dispersion:** computation of Range, Quartile Deviation, Standard deviation, variance and their coefficients.	**12**
2	**CORRELATION AND REGRESSION MEASUREMENT:** Correlation, Types of Correlation, Methods for finding correlation: Scatter Diagram Method, Karl Pearson's correlation co-efficient method, Spearman's Rank Correlation co-efficient, Regression Analysis, Regression co-efficients, Lines of regressions, Properties of regression co-efficient.	**08**
3	**SAMPLING TECHNIQUES:** Sample, Population, Sampling, Methods of Sampling, Sampling and Non-Sampling errors.	**08**
4	**TESTS OF SIGNIFICANCE:** Introduction, Null Hypothesis, Alternative Hypothesis, Test of Hypothesis, Type -I and Type-II Errors, Level of Significance, Degree of Freedom, One Tail and two tail test, standard error. **Small Sample Test :** Stuent's t-test, F-Test, Chi square test for Goodness of Fit, Independence of two Attributes, Homogeneity, One way and Two way Analysis of Variance (ANOVA)	**12**
5	**MS EXCEL:** Introduction, Calculation in Excel, Statistical Functions in Excel, Drawing Graphs, Working with Data, Pivot tables and charts. Data Analysis using MS Excel such as graphs, statistical functions and tools.	**05**

Practical content: Term Work and Practical shall be based on the above syllabus.

Text Books:

1	Fundamentals of Biostatistics by Irfan Ali Khan and Atiya Khanum UKaaZ Publication
2	Biostatistics: A Foundation for Analysis in The Health Science by Wayne W Daniel, Wiley Series in Probability and Statistic,7e.

Reference Books

1	Introduction to Biostatics and Computer science - Y. I. Shah, Dr. A. R. Paradkar, and M. G. Dhaygude, NiraliPrakashan, Pune.
2	Methods of Biostatics for Medical and Research students - B. K. Mahajan, Jaypee brothers medical publishers (P) Ltd., New Delhi
3	Fundamentals of Applied statistics - S. C. Gupta, V. K. Kapoor, Sultan Chand and Sons Publishers, New Delhi.