SOLAPUR UNIVERSITY, SOLAPUR
Semester Pattern Syllabus
M.Com. Part II
Advanced Statistics – Paper III
(Industrial Statistics)
(w.e.f.June-2014-15)
Semester III

Unit 1:
Introduction to Statistical Quality control Chance causes, assignable causes, process Control, Product Control, Construction of control Chart, Statistical basis of control Limits of Control chart and uses of control chart, Natural tolerance limits and specification limits. **(15 Periods)**

Unit 2 :

Control Charts for Variables: control chart for mean ($\bar{x}$ chart) and Range (R – chart.) Derivation of Control Limits of $\bar{x}$ & R charts when Standards are given and standards are not given. Concept of group, Control chart, Numerical examples. **(15 Periods)**

Unit 3 :

Control Chart for Attributes : control chart for number of defectivesd – Chart for variable and for fixed sample size, derivation of control limits When standards are given and standards are not given. Control chart for fraction defectives (P – Chart), Derivation of control limits when standards are given and standards are not given. Control chart for number of defects per unit (C chart), situations where C chart is useful, derivation of control limits when standards are given and standards are not given. Numerical Examples based on np, P and C Charts. **(15 Periods)**

Unit 4 :

Basic Concepts of Acceptance Sampling : Definition and Concept of producer's risk, consumer's risk, AQL, LTPD, AOQ, AOQL, ASN, ATI and OC curve. Interpretation of AOQ, ASN and OC curves.

Books Recommended :

1 .   E.L. Grant: Statistical Quality Control
2 .   Duncan A.J. : Quality Control and Industrial Statistic:
3 .   V.K. Kapur and S.C. Saxena : Fundamentals of Applied Statistics
4 .   S.C. Gupta and V.K. Kapoor :- Fundamentals of Applied Statistics
5 .   Banjamin : Elements of Vital Statistics.

SOLAPUR UNIVERSITY, SOLAPUR
Semester Pattern Syllabus
M.Com. Part II
Advanced Statistics – Paper III
(Industrial Statistics and Demography)
Semester IV

Unit 1 :

Acceptance Sampling Plans: Single and double sampling plan for Attributes. Construction of AOQ, OC and ASN curves for Single Sampling plan. Acceptance sampling plan for variables. **(15 Periods)**

Unit 2 :

Introduction of Demography and Mortality Rates : Introduction, Vital Statistics and uses of Vital Statistics,. Mortality Rates. Crude death rate, specific death rate, standardized death rate (by direct & indirect method) Merits and demerits of CDR, SDR and STDR. Numerical Examples. **(15 Periods)**

Unit 3 :

Life Table and Fertility Rates : Assumptions, Description and Construction of Life table. Uses of life Table. Fertility Rates : Specific fertility rate, Total fertility rate with merits and demerits. Numerical Examples. **(15 Periods)**

Unit 4 :

Population Growth Rates: Crude rate of natural increase and Pearle's Vital index. Gross reproduction rate, Net reproduction rate and their merits, demerits and interpretation. Numerical examples. **(15 Periods)**

Books Recommended :

1. E.L. Grant: Statistical Quality Control

2. Duncan A.J. : Quality control and Industrial Statistic:

3. V.K. Kapur S.C. Saxena: Fundamentals of Applied Statistics

4. S.C. Gupta and V.K.Kapoor :- Fundamentals of Applied Statistics

5. Speigiman: Demography

6. Sreecvastava: A text book of demography

7. Cox PR. : Demography

8. Benjamin: Elements of Vital Statistics

SOLAPUR UNIVERSITY, SOLAPUR
Semester Pattern Syllabus
M.Com. Part II
Advanced Statistics – Paper IV
(Statistical Models for Business Decisions)
Semester III

Unit 1 : **Theory of Games**
Characteristics of game problem, Rules for game theory, Definitions of saddle point, Value of game.
Determination of value of game by 1) saddle point method 2) dominance property 3) Mixed strategies
Two person Zero sum game with saddle point, without saddle point mixed strategies for 2 x n games and m x 2 games.
Simple examples based on these.   **(15 periods)**

Unit 2 : **Queueing models**
Applications of queueing models, operating characteristics of a queueing system. Definitions of waiting time and idle time costs.
Single channel Queueing Theory
Model I :   Single channel Poisson Arrivals with Exponential
                    Service (M|M|1) (FCFS/00/00)
         Assumptions and limitations.
Model II :   Generalisation of model (M|M|1) (FCFS/00/00)
                    (Birth – Death Process)
                    Simple Examples based' on these   **(20 periods)**

Unit 3 : **Sequencing Techniques :**
Assumptions in Sequencing problems; Determination of optional sequence and total time for n-jobs through 2 machines,
3 Machines and M Machines.
    Solution of complicated Sequencing Problems.
        Simple examples based on there   **(10 periods)**

Unit 4 : **Simulation**
Introduction of Simulation, when to use simulation ?
Advantages of simulation, Limitations of simulation,
    Applications of simulation, Monte Carlo Simulation,
    Generation of Random Numbers. Simple Examples
    Based on these.   **(15 periods)**

Books recommended
1. Operations Research by Kantiswaruy
2. Operations Research by S.D. Sharma
3. Operations Research by R.K. Gupta
4. Operations Research by Kantiswaruy, Goon Gupta, & Das Gupta
5. Operations Research by Prem Kumar Gupta and D.S.Mira

SOLAPUR UNIVERSITY, SOLAPUR
Semester Pattern Syllabus
M.Com. Part II
Advanced Statistics – Paper IV
(Statistical Inference)
Semester IV

Unit 1:

Concept of discrete and continuous random variable; Definitions of probability mass function (pmf), probability density function (PDF) Distribution function, first four raw and central moments, expectation, simple examples on these concepts.   **(15 Periods)**

Unit 2 :

Concept of parameter, statistic, estimate, estimator, general idea of estimation of unknown parameter, requisites of a good estimator: viz, unbiasedness, consistency, efficiency and sufficiency.   Simple examples based on these
Methods of Estimation 1) Method of Moments 2) Method of Maximum likely hood   **(20 periods)**

Unit 3 :

Testing of Hypothesis : Concept of hypothesis, (Simple and compound hypothesis), Null hypothesis, Alternative hypothesis, critical region, level of significance, Type I-error and Type – II error. Idea of single and double tailed tests.   **(15 periods)**
Simple examples based on these.

Unit 4 :

Concept and meaning of Most powerful Test (MP Test) uniformly Most powerful test (UMP test), likelihood Ratio Test (LR Test). Illustrative examples.   **(10 periods)**

Books Recommended

1. Mathematical statistics by SC Gupta & V.K. Kapoor

2. Fundamentals of Statistics by S.C. Gupta.

3. Statistical Inference by V.K. Rohtagi

4. Fundamentals of Statistics by D.N. Enhance & Veena Enhance

5. An Adv Theory of Statistics Vol II by M.G. Kendal & A Stuart

6. Probability Theory & Mathematical Statistics V.K. Rohtagi

7. Statishcal Inference Suxena & Surendran