

**M.Phil  
STATISTICS**

**Prospectus No.20101230**

**संत गाडगे बाबा अमरावती विद्यापीठ**

**SANT GADGE BABA AMRAVATI UNIVERSITY**

**(FACULTY OF SCIENCE)**

**PROSPECTUS**

**OF**

**M.Phil in (Statistics)  
2009-10 for Regular and  
2009-2011 for Vacation**



**2009**

**(Price -Rs. 7/-)**

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**Examination leading to the Degree of Master of Philosophy (M.Phil.) (तत्त्वज्ञान पारंगत) in the Faculty of Arts/Social Sciences/Commerce/ Science /Education/Home-Science.**

1. The Examination leading to the Degree of Master of Philosophy(M.Phil) in the Faculty of Arts/ Social-Sciences/Commerce/ Science/Education /Home-Science shall be held annually on the date as decided by the Board of Examinations.

Provided that, the examination of M.Phil. (Physical Education) shall be held twice a year at such places and on such dates as may be appointed by the Academic Council.

2. Subject to compliance with the provisions of this Ordinance and of other Ordinances in force from time to time an applicant for admission to the Master of Philosophy (M.Phil.) Degree Examination shall have:-
- i) Passed the Master's Degree with atleast 55% marks or its equivalent grade in the subjects comprised in the Faculty concerned of the University or any other Examination recognised by the University as equivalent thereto and good academic record :

Provided that candidates who are teachers in the University shall be given preference for admission to the course :

Provided further that the condition of Master's Degree in the relevant subject with atleast 55% marks or its equivalent grade and good academic record may be relaxed for those who are already recognised as University or College Teachers; and

- ii) Prosecuted a regular Vacation full time course of approximately 180 periods of 45 minutes each distributed as under:-
- (a) 3 weeks in the Winter Vacation (First Term)
- (b) 6 weeks in the Summer Vacation after the First Term (Second Term)
- (c) 3 weeks in the Winter Vacation after the Second Term (Third Term) and

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% As made by the Executive Council, dated 27/28-4-1979 and amended vide Ordinance Nos. 17 of 1979, 78 of 1981, 3 of 1982, 7 of 1983, 19 of 1983, 9 of 1986, 5 of 1987, 5 of 1990, 3 of 1991, 8 of 1994, 1 of 1996, 1 of 1997, 3 of 1999 and 5 of 2000.

- (d) 6 weeks in the Summer Vacation after the Third Term (Fourth Term)

OR

- iii) Prosecuted a regular full time course of one academic session as a student of a College or a Department of the University.
3. Without prejudice to the other provisions of Ordinance No. 6 relating to Examinations in General ,the provisions of paragraphs 5,8,10 and 32 of the said Ordinance shall apply to every collegiate candidate.
4. 1) The fee for the Examination shall be Rs. 202/- plus Rs 20/- Per Practical Examination.
- 2) The candidates desiring to take M.Phil. Examination either through Vacation Course or Regular Course Shall submit their applications with full fee at least three months prior to the date of the Examination.
5. 1) The scope of the subjects shall be as indicated in the syllabus.
- 2) The medium of instruction and Examination shall be English only except for the courses in languages.
- 3) Examinees shall have option to write their answers through either Marathi, Hindi or English medium.
- 4) A candidate may opt to write his dissertation in any of the three media (English, Marathi, Hindi)
- 5) The question papers for M.Phil. Examinations in the faculties of Social Sciences and Commerce shall be set in English, Marathi and Hindi Languages.
6. 1) The Examination shall consist of the Theory Paper, Practical, College Assessment and Dissertation with the maximum and minimum pass marks as shown in the respective Appendices to this Ordinance for the Examinations in the Faculties concerned.
- 2) The minimum pass standard for the Examination except for Dissertation shall be 50% in each paper including the Sessional. The Dissertation shall be graded at two levels either Pass or Fail. Examiners (including revaluer) of dissertation should submit their detail reports regarding acceptance or rejection of dissertation. Passing in each Paper in M.Phil, shall be compulsory.
- 3) The norms relating to internal assessment in each M.Phil. paper excluding the Dissertation shall be as under:
- (a) Tutorial/Home-assignment - 8 Marks.
- (b) paper presented by the Student at the Seminar,

Participation in discussion at the Seminar, Group discussion etc. 7 Marks.

- (c) Interview by the M.Phil. Committee of the Department / College in which regularity in attendance, performance of the student in the class-room, his library work, participation in class-room, general performance, etc. to be taken into account . 5 Marks.
- d) The Dissertation Committee means a Committee constituted in the College/Department for any particular subject for approving the subject of dissertation, appointing recognised guide/Supervisor and to conduct the M.Phil. Programme. It shall maintain the complete information of the titles of the dissertations subject-wise for future reference for the M.Phil. students and the dissertation Committees for subsequent years, and the College/Department shall also send a copy thereof to the Asstt. Registrar (Exams. )who shall maintain a register with the complete information of the titles of the Dissertation subject-wise in each Faculty, for future reference of the examinees and others concerned.
- e) No Supervisor shall guide at a time more than 5 students for Dissertation.
7. 1) The Principal/Head of the Institution /Department shall forward to the University the record of Internal Assessment/Sessional Marks of Examinees one month before the Commencement of the Examination.
- 2) The Principal of the College or Head of the Department where the M.Phil. Course is conducted shall submit to the University a list of students in each subject with the titles of their dissertations indicating specialised branch of the subject against each dissertation for information of the appointment of Examiners Committee for making appropriate appointments.
- 3) A candidate who has offered thesis for Ph.D. in a particular subject can offer the same subject for Dissertation in M.Phil.
- 4) A Candidate cannot offer an identical subject for Dissertation in the same year which has been offered by another M.Phil. candidate at his or other places.
8. 1) The candidate desiring to take M.Phil. examination shall submit two copies of his Dissertation containing material of about 125 typed papers.(Full Scape double space) or its equivalent neatly hand-written in a tidy form to the University through his

Supervisor and the Principal /Head of the Institute/Department at least a fortnight prior to the date of commencement of the written examination.

- 2) A candidate shall submit with his Dissertation a certificate from his Supervisor to the effect:
- i) that the candidate has satisfactorily conducted research for not less than one academic year; and
- ii) that the Dissertation is the result of the candidate's own work and is of sufficiently high standard to warrant its presentation for examination.
- 9) Provision of Ordinance No. 7-A relating to the condonation of deficiency of marks for passing an examination shall apply to the examinations under this Ordinance.
- 10) There shall be no classification of examinees successful at the Examination.
- 11) (a) If a candidate has successfully passed in Dissertation, he shall not be required to submit the dissertation again for subsequent re-admission to the examination as ex-student.
- (b) If a candidate has successfully passed in all theory papers separately and simultaneously, but has failed in dissertation, he shall not be required to appear again in theory papers for subsequent re-admission to the examination as an ex-student for clearing the dissertation.
- (c) If a candidate fails in dissertation, on application by the candidate with a fee Rs.150/- within 20 days of declaration of result, the dissertation will be sent to two other examiner for reassessment. Majority decision of the two examiners(including the first) will be final.
- 12) As soon as possible but within 45 days from the last date of examination, the Board of Examinations shall publish a list of Successful Examinees. Only such Examinees who have secured minimum aggregate pass marks in the Papers as indicated in the respective Appendices and have been declared "Pass" in the Dissertation shall only be declared successful.
- 13) Notwithstanding anything to the Contrary in this Ordinance, no person shall be admitted to an Examination under this Ordinance if he has already passed this examination or an equivalent examination of any Statutory University.
- 14) Successful Examinees shall on payment of the prescribed fees receive a Degree in the prescribed form signed by the Vice-Chancellor.

**SYLLABUS  
PRESCRIBED FOR  
M.Phil. COURSE IN STATISTICS**

**Paper-I**

Marks : 80

Internal Assessment : 20

Total : 100

**Unified Sampling Theory**

**Section-‘A’**

Problem of estimation infinite sampling, sampling designs, general properties, Detailed study of VTV-estimators in survey sampling, admissibility and hyperadmissibility of estimators for finite populations, principles of sufficiency and likelihood in survey sampling, Bayes approach to the problem, choice of optimum sampling strategy.

**SECTION-‘B’**

Inference under super population models: Design unbiased estimation, prediction approach using tools of classical and Bayesian inference.

**References :-**

**For Section : A**

1. Basu D. (1960) : Role of the sufficiency and likelihood principles in sample survey theory, Sankhya A, 31, 441, 454.
2. Cassel Sarandal and Wretman : Foundations of inference in survey sampling
3. Hanuro, T.V. (1968) : Hyperadmissibility and optimum estimators for sampling finite populations A.M.S. 39, 621, 642.
4. Lanke, J. (1973) : On UMV-estimators in survey sampling Matrika, 20, 196-202
5. Lanke, J. and M.K. Ramdrishnan: ‘Hyperadmissibility in survey sampling’ Ann. of statistics 2.205-215.
6. Ramkrishnan M.K. (1975) : ‘Choice of an optimum strategy-I’ Ann. of statistics, 8, 669-679.
7. Sarandal (1976) : ‘On uniformly minimum variance estimation in finite populations’ Ann. Statistics, 4, 998-997.

8. Godambe V.P. : ‘A unified theory of sampling from finite populations’ J.R.S.S.B. 17, 269-278.

**PAPER-II**

**ECONOMETRICS**

**SECTION-‘A’**

Multiperiod models of consumption, investment and production probabilistic and game theory models of economic behaviour. Linear programming analysis of a firm and imputed prices. Bayesian inference in Econometrics (Rational Random Behaviour).

**SECTIONS-‘B’**

Estimation of Elasticities and Technical progress. Properties of Estimators under methods of Instrumental Variable. Dummy variables, Stochastic Regressors, Mixed estimation Methods. Application of methods of principal Components, Canonical Correlation, Discriminating Analysis in Econometrics, Econometric models of Forecasts, Forecasting power. Introduction to stimulation processes and models.

**REFERENCE:**

1. A. Koutsoyiannis : Theory of Econometrics.
2. A. Koutsoyiannis : Modern Micro-economics.
3. Hermi Theil : Introduction to Econometrics.
4. J.N. Johnston : Econometric Methods.
5. R.Borfman. P- Samuelson : Linear programming and Economic analysis R.Solow analysis.
6. Gunter Menges. : Economic Decision Making.
7. Josef Hadar : Mathematical Theory of Economecs Behaviour.
8. R.GD.Allon : Macro-Economics Theory.
9. E.Malinvaud : Statistical Methods of Econometrics.
10. A.A. Walters : An Introduction to Econometrics.
11. Robert S.Pidyck Daniol : Econometric Models and Economic. L. Rubinfeld Forecasts.
12. Henderson and Quandt. : Micro-economic Theory.

**PAPER-III RESEARCH METHODOLOGY**

1. Research as a way of progress, Meaning of Science Scientific method, Difference between philosophy, Science, theory, law and fact. Research, its-aim, nature and method. Motivation in Research, types

of research, Approaches to investigation, Pure and applied research, Criteria of good research.

(10 periods)

2. Research methods : Survey, comparative method, interview questionnaire, laboratory experimentation, problem method, field study, case study, Criteria for selection of problems, selection of problem, review of literature, Formulation of problems and hypothesis.  
(10 periods)
3. Research programme needs, coordinated research programme. Selection of method, preparing a) plan of synopsis b) Collection of data c) primary and secondary sources of data d) Analysis of the data. Sampling, types of evidences, Inference from data.  
(10 periods)
4. Decision Theory : Decision functions, risk functions, Randomized and nonrandomized decision rules, optimal decision rules, Bayes rule for estimation. Admissibility, Complete class of decision rules, Essentially complete class of decision rules, Minimax theorem, Invariant decision rules, admissible and minimax decision rules.  
(15 periods)
5. Methods of Estimation : Minimum variance, Unbiased estimation, Bayes theorem, Empirical bayes estimation procedure, Minimax principle. Principle of invariance, Criteria of estimation in large samples, some methods of estimation in large samples. Asymptotic properties of Maximum likelihood estimator, Estimation of the multinomial distribution, Estimation of parameters in the general case, The method of scoring, for the estimation of parameters.  
(15 periods)

**List of reference books for the topics on decision and methods of estimation.**

1. Blackwell & Girshick (1954) : Theory of games and Statistical Decisions.
2. Ferguson (1967) : Mathematical Statistics A decision theoretic approach.
3. Berger, J. : Statistical Decision theory.
4. Rao, C.R. : Linear Statistical Inference & its applications.
5. Rohatgi V.K. : Probability theory and Mathematical Statistics.
6. Zacks, S. : Theory of Statistical Inference.
7. Wald, A. : Statistical decision functions.
8. Savage, L. : Foundations of Statistics.

**Books Recommended :**

1. Kentor, J.R. 1953 : The logic of Modern Science Bloomington Indiana : Principin Press.
2. Sarton, G 1952 : A Guide to the History of Science Chromica Butanica Co., Waltham, Mass
3. Toulmin S. : The Philosophy of Science. An Introduction Longmans, Gree, New York.
4. Benjamin, A.C., 1957 : An Introduction to the Philosophy of Science, Macmillan, New York.
5. Cohen, M.R. and E.Nagel 1934 : An Introduction to Logic Scientific Method Harcourt Brace, New York.
6. Williams, C.B. and Stevenson 1950 : Research Manual, Revised ed. Harper & sons, New York.
7. Workmeister, W.H. : The Philosophy of Science Harper and Bros., New York.
8. Fiesher, L.R. and : Style Guide for Chemists. Asia Pnbl., Bombay. Ficsar, 1961
9. Trelease, S.F. 1961 : Scientific paper, How to prepare it, How to write it?: A handbook for students and research Workers in all Branches of Science. 2ne ed. Willams and Wilkins Co., Baltimore.
10. Sadhu, A.N. & Singh 1985 : Research Methodology in Social Himalaya Publ. House, Bombay.
11. Wilknsn, T.S. and Bhandarkar, P.L. 1984 : Methodology and Techniques of Social Research. Himalaya Publ. House, Bombay.
12. Hope, K. 1967 : Elementary Statistics, Pergamon Press New York.
13. Johnson, P.O. : Statistical Methods in Research. Prentice Hall, New York.
14. Hogel, E. 1961 : The Structure of Science Problem in the Logic of Scientific Explanation, Hartcourt, Brace, New York.
15. Dixon, W.H.F. : An Introduction to statistical Analysis Mc Graw Hill. Massey ((Jr.)
16. Keyberg (Jr.) : Philosophy of Science- A formal approach, Macmillan, New York.

17. Thehalf, D.W. 1968 : An Introduction to Philosophy of Science, Methuren, London.
18. Anderson, J. 1951 : Thesis and Assignment writing Wiley Eastern, New Delhi.
19. Murthy, M.N. 1967 : Sampling Theory and Methods Statistical Publ. Co. Calcutta.
20. Ailen, E, 1967 : Statistical Methods 2<sup>nd</sup> Ed. Reinhart & Winston, New York.
21. Fisher, R.A. 1958 : Statistical Methods for Research Workers. 13<sup>th</sup> ed. Hafner Publ. New York.
22. John, P.W.M. : Statistical Design and Analysis of Experiments Macmillan, New York.
23. Chaturvedi, 1953. : Mathematical Statistics, Nok, Jbonk Karyalaya, Agra.
24. Coehran, W.G. 1963 : Sampling Techniques, 2<sup>nd</sup> Ed. John Wiley & Son, New York.
25. Croxton, F.E, Cowden and S.Klein 1975 : Applied General Statistics 3<sup>rd</sup> ed. Prentice–Hall, New Delhi.
26. Ross, R. 1974 : Research, An Introduction. Barnes and Noble Books, New York.
27. Hilway, T. 1964 : Introduction to research 2<sup>nd</sup> ed, Hongthon Mifflin, Boston.
28. Emberger, M.R. Ross : Scientific Writing. Hart Court, Brace, New York. 1955
29. Freedman, P. 1960 : The Principles of Scientific Research, Pergamon Press, New York.
30. Jones, W.P. 1971 : Writing Scientific Papers and Reports, William C.Brown, Dubngue
31. Mills, G.H. and Winstan, and J.A. Walter 1962 : A Technical Writing, Holt, Reinhert New York.
32. Arlains, H. and R.R.Colton 1940. : Graphs : How to make and use them. Harper and Bross, New York.
33. Papp, C.F. 1968 : Scientific Illustration, William C. Brown Publishers, Dubunge, Iowa.
34. Grazde, E.E. 1966 : Handbook of Applied Mathematics. Van Nosstrand, Princeton, N.J.
35. Whitney, F.L. 1950 : The Elements of Research. 3<sup>rd</sup> ed. Prentice Hall, New York.
36. Lacey, O.L. 1953 : Statistical Methods in Experimentation An Introduction, MacMillan, New York.

37. Connaat, J.B. 1947 : On Understanding Science: An Historical Approach Yale, New Haven.
38. Good, C.V. and D.E.Skates 1954. : Methods of Research, Appleton Century Croys, INC.
39. Cole A.H. and K.W. Bigelow 1935 : A Mannual of Thesis Writing. John Wiley and Sons, New York.
40. Flesch, R. and A.H.Lass 1949 : The way to Write, Revised ed. Harper & Bros. New York.
41. Gaum, C.G and H.F. Graves 1934 : Report writing Prentice Hall, New York.
42. Kothari C.R. : Research Methodology. Methods and Techniques. Wiley Easter, New Delhi.
43. Ackoff, R.L. 1962 : Scientific Method. John Wiley and Sons, New York.
44. Barzun J. and H.F.Henry, 1970 : The Modern Researcher, Rev. ed. Hardcourt, Brace, New York.
45. Chance, W.A. 1975 : Statistical Methods of Decision Making D.B. T. Taraporewala Sons, Bombay.
46. Johnson, E. 1951 : The Research Report: A guide for the Beginner, Ranald Press
47. Kish L. : Survey Sampling, John Wiley, New York.
48. Kothari, C.R. 1984 : Quantitative Techniques. Vikas Publishing House.
49. Lastrucci, C.L. : The Scientific Approach : Basic Principles of the Scientific Method. Schankman Publishing, Combridge.
50. Piaget.J. 1973 : Main trends in Interdisciplinary Research Gorge Allen, London.

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EXAMINATION LEADING TO THE DEGREE OF MASTER OF  
PHILOSOPHY (M.Phil. ) IN THE  
FACULTY OF SCIENCE

Sr. No.	Subject & Paper	Paper College Assessment	Maximum Marks	Minimum pass Marks
1.	Paper I	Paper College Assessment	80 20 100	50
2.	Paper II	Paper College Assessment	80 20 100	50
3.	Paper-III 'Research Methodology' & Statistical Inference For M.Phil Statistics 'Research Methodology' For M.Phil. in Science subjects other than Statistics	Paper College Assessment	80 20 100	50
4.	Dissertation	-	- -	-

Notes:-

- 1) The approach to Dissertation should be with a stress more on depth rather than on width.
- 2) The Dissertation will be graded as either Pass or Fail

**SANT GADGE BABA AMRAVATI UNIVERSITY AMRAVATI****SPECIAL NOTE FOR INFORMATION OF THE STUDENTS**

- (1) Notwithstanding anything to the contrary, it is notified for general information and guidance of all concerned that a person, who has passed the qualifying examination and is eligible for admission only to the corresponding next higher examination as an ex-student or an external candidate, shall be examined in accordance with the syllabus of such next higher examination in force at the time of such examination in such subjects papers or combination of papers in which students from University Departments or Colleges are to be examined by the University.
- (2) Be it known to all the students desirous to take examination/s for which this prospectus has been prescribed should, if found necessary for any other information regarding examinations etc., refer the University Ordinances Booklet the various conditions/provisions pertaining to examination as prescribed in the following Ordinances.

Ordinance No. 1	:	Enrolment of Students.
Ordinance No. 2	:	Admission of Students
Ordinance No. 4	:	National cadet corps
Ordinance No. 6	:	Examinations in General (relevant extracts)
Ordinance No. 18/2001	:	An Ordinance to provide grace marks for passing in a Head of passing and Improvement of Division (Higher Class) and getting Distinction in the subject and condonation of deficiency of marks in a subject in all the faculties prescribed by the Statute NO.18, Ordinance 2001.
Ordinance No. 9	:	Conduct of Examinations (relevant extracts)
Ordinance No. 10	:	Providing for Exemptions and Compartments
Ordinance No. 19	:	Admission of Candidates to Degrees.
Ordinance No. 109	:	Recording of a change of name of a University student in the records of the University.

Ordinance No. 6/2008	:	For improvement of Division/Grade.
Ordinance No.19/2001	:	An Ordinance for Central Assessment Programme, Scheme of Evaluation and Moderation of answerbooks and preparation of results of the examinations, conducted by the University, Ordinance 2001.

**J.S.Deshpande**

Registrar

Sant Gadge Baba Amravati University

**PATTERN OF QUESTION PAPER ON THE UNIT SYSTEM**

The pattern of question paper will be broadly based on the following pattern.

- (1) There will be Eight Questions on all chapters covering the whole syllabus.
- (2) Examinee has to attempt any Four Questions out of Eight.
- (3) Every paper carry 80 marks and each Question will carry equal marks.

**DIRECTION**

No.32/2006

Date : 19.10.2006

**Sub : The Examination leading to the Degree of Master of Philosophy (M.Phil.) in the Faculty of Arts/ Social Sciences / Commerce / Science / Home Science / Education.**

Whereas, Ordinance No.164 relating to the Examinations leading to the degree of Master of Philosophy is provided for the M.Phil. Courses.

**AND**

Whereas Para 7 of Statute No.2/2001, in respect of Implementation of the revised pay scales of teachers and other measures for maintenance of standards in Higher Education for University/College teachers and University Officers Statute, 2001, provides under the title Recruitment and qualifications for appointment of teachers that "A relaxation of 5% may be provided, from 55% to 50% of the marks, at the Master's level for the SC/ST category."

**AND**

Whereas, the UGC has relaxed the eligibility qualification for SC/ST candidates for appearing the NET/SET examinations.

**AND**

Whereas, it is necessary to relaxed the percentage for admission to M.Phil.Courses for SC/ST category candidates from 55% to 50%.

**AND**

Whereas, matter is required to be regulated by Ordinance.

**AND**

Whereas, the amending Ordinance No.164 is a time consuming process

**AND**

Whereas, admission of the students for the Vacational M.Phil.Courses for the sessions 2006-2008 are to be finalised.

**AND**

Whereas, to finalise the admission for M.Phil. Courses, it is necessary to provided relaxation for SC/ST category.

Now, therefore, I, Dr.Kamal Singh, Vice-Chancellor of Sant Gadge Baba Amravati University, Amravati in exercise of powers conferred upon me under sub-section (8) of the Section 14 of the Maharashtra Universities Act,1994, hereby direct as under :-

1. This direction may be called "Examinations leading to the Degree of Master of Philosophy (M.Phil.) (तत्त्वज्ञान पारंगत) in the Faculty of Arts/ Social Sciences / Commerce / Science / Education/Home Science, Direction 2006".
2. This direction shall come into force from the date of its issuance.

3. The conditions of atleast 55% marks at Master's Degree or its equivalent grade in the subjects comprised in the Faculty concerned of the University or any other examinations thereto, shall be relaxable from 55% to 50% marks at the Master's level for the SC/ST category candidates.

Amravati

Sd/-

(Kamal Singh)

Date : 18.10.2006

Vice-Chancellor

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