

**GOVERNMENT OF KARNATAKA
DEPARTMENT OF COLLEGEIATE EDUCATION**

**M.Sc Microbiology (PG) Syllabus
From 2018-2019**

**M.Sc DEGREE (SEMESTER) COURSE UNDER CBCS- SCHEME
SCHEME OF TEACHING AND EXAMINATION
(Effective from the academic year 2018-19 and onwards)**

**DEPARTMENT OF STUDIES (PG) AND RESEARCH IN
MICROBIOLOGY**

**GOVERNMENT COLLEGE (AUTONOMOUS),
KALABURAGI**

Approved by Academic Council



PRINCIPAL

Govt. College

Kusnoor Road, GULBARGA-585 105

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DEPARTMENT OF COLLEGEIATE EDUCATION

GOVERNMENT COLLEGE (AUTONOMOUS), KALABURAGI

M.Sc DEGREE (SEMESTER) COURSE UNDER CBCS- SCHEME

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Subject Code	PAPERS	Total Credits	Teaching hrs/week	Exam Marks	IA	Exam hrs	Total marks
I SEMESTER							
CCT 1.1	Fundamentals of Microbiology	4	4	80	20	3	100
CCT 1.2	Cell Biology & Biochemistry	4	4	80	20	3	100
CCT 1.3	Bacteriology	4	4	80	20	3	100
DSET 1.1	a. Mycology and Virology b. Biological Chemistry	4	4	80	20	3	100
CCP/DSEP1.1	Practical 1.1	4	8	80	20	4	100
CCP/DSEP1.2	Practical 1.2	4	8	80	20	4	100
	Total	24				Total	600
II SEMESTER							
CCT 2.1	Microbial Metabolism & Enzymology	4	4	80	20	3	100
CCT 2.2	Microbial Genetics	4	4	80	20	3	100
DSET 2.1	a. Environmental Microbiology b. Bioprocess Technology	4	4	80	20	3	100
GET 2.1	General Microbiology	4	4	80	20	3	100
CCP/DSEP2.1	Practical 2.1	4	8	80	20	4	100
CCP/DSEP2.2	Practical 2.2	4	8	80	20	4	100
	Total	24				Total	600

III SEMESTER							
CCT 3.1	Medical Microbiology & Pharmaceuticals	4	4	80	20	3	100
CCT 3.2	Food & Dairy Microbiology	4	4	80	20	3	100
DSET 3.1	a. Genetic Engineering & R-DNA Technology b. Molecular Biology	4	4	80	20	3	100
GET 3.1	Microbes in Human Welfare	4	4	80	20	3	100
CCP/DSEP3.1	Practical 3.1	4	8	80	20	4	100
CCP/DSEP 3.2	Practical 3.2	4	8	80	20	4	100
	Total	24				Total	600
IV SEMESTER							
CCT **4.1	Industrial Microbiology	4	4	80	20	3	100
CCT 4.2	Immunology & Immunotechnology	4	4	80	20	3	100
DSET 4.1a 4.1 b	Agricultural Microbiology Microbial Technology	4	4	80	20	3	100
CCP/DSEP4.1	Practical 4.1	4	8	80	20	4	100
CCP/DSEP4.2	Practical 4.2	4	8	80	20	4	100
CCPR 4.1	PROJECT WORK	6	6	120	30	4	150
	Total	26				Total	650
	TOTAL MARKS (I TO VI SEMESTERS)	98		1960	490	Grand Total	2450

CCT – Core Course Theory.
GET- General Elective Theory
DSEP- Discipline Specific Elective Practical
CCPR –Project Work

DSET – Discipline Specific Elective Theory
CCP - Core Course Practical
GEP- General Elective Practical

- II Semester water plant visit and soil & water sample collection study trip submit the report at the time of examination.

**** IV Semester- Industrial visit Study tour and submit the Report at the time of examination compulsory**

I SEMESTER

PAPER – CCT 1.1 : Fundamentals of Microbiology

- Unit-1.** **12 hrs**
History of Microbiology: Development and scope of Microbiology; Theories of spontaneous generation; Biogenesis and Germ theory of disease; Contributions of Antony van Leeuwenhook, Edward Jenner, Joseph Lister, Louis Pasteur and Robert Koch
Micro organisms; General characteristics of major groups of micro organisms; Prokaryotes and Eukaryotes- viruses, bacteria, fungi, algae and protozoa. A comparative account of prokaryotes and eukaryotes; General structure and functions of cell membrane, membrane bound organelles and cell organelles.
- Unit-2** **10hrs**
Distribution of Microorganisms: Distribution of micro organisms in soil, air and water,.
Microscopy: Working principle, construction and operation of different types- Simple, compound, phase contrast, fluorescent and electron microscope. Micrometry and photomicrography.
- Unit-3** **10hrs**
Sterilization and Disinfection: Principles, types and technique, physical, chemical, radiation and mechanical methods. Microbiological media: Components, preparation and types- basal, special differential, indicator, enriched and transport media.
- Unit-4** **10hrs**
Pure culture techniques: isolation of different micro organisms from different environment. Simple collection, preservation and enrichment. Different methods of isolation- pour plates, spread plate, serial dilution. Maintenance and preservation of microbial cultures: slant culture, stab culture, soil culture, mineral oil and overlaying and glycerol preservation. Lyophilization. Type culture collection centres- Indian and global- ATCC, MTCC and NCIM etc.
- Unit-5** **10hrs**
Staining techniques: Nature and types of stains. Principle, mechanism, -Simple, differential – gram's, AFB staining, Negative staining, Structural staining techniques- spores staining, flagella staining, capsule staining, cell wall staining, food granules staining. Algae and fungal staining methods, wet mounting methods.
- Unit-6** **12hrs**
Working principle and operation of instruments used in microbiology laboratory- Autoclave, laminar air flow system, incubator, pH meter, spectrophotometer, electrophoretic unit, centrifuge, chromatography, x ray diffraction crystallography; R, NMR and Mass spectroscopy. Safety measures of microbiological laboratory, levels of laboratory and good laboratory practices.

