KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ

ಸ್ವಾತಂತ್ರ್ಯದ ಅಮೃತ ಮಹೋತ್ಸವ

Tele: 0836-2215224
e-mail: academic.st@kud.ac.in
Pavate Nagar,Dharwad-580003
ಪಾವಟೆ ನಗರ, ಧಾರವಾಡ – 580003

NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU/Aca(S&T)/JS-125/ Sci. Fac./2022-23/1351 Date: 29 NOV 2022

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2022–23ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿಗಾಗಿ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಅಡಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ ಸ್ನಾತಕ ಸೂಕ್ಷ್ಮ ಜೀವಶಾಸ್ತ್ರ (Microbiology) ಪದವಿಯ 5 ಮತ್ತು 6ನೇ ಸೆಮೆಸ್ಟರ್‌ನ SEC ಸೈದ್ಧಾಂತಿಕ ಪತ್ರಿಕೆಯ ಬದಲಾಗಿ ಪ್ರಾಯೋಗಿಕ ಪತ್ರಿಕೆಯಾಗಿ ಪಠ್ಯಕ್ರಮದಲ್ಲಿ ಪರಿವರ್ತಿಸಿ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

ಉಲ್ಲೇಖ: 1. ವಿಶೇಷ ಅಭ್ಯಾಸಸೂಚಿ ಮಂಡಳಿ ಠರಾವು ದಿ: 23.11.2022.
2. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ: 29/11/2022

ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳನ್ವಯ ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶದ ಮೇರೆಗೆ, 2022–23ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿಗಾಗಿ **ಸಿ.ಬಿ.ಸಿ.ಎಸ್.** (CBCS) ಅಡಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ ಸ್ನಾತಕ ಪದವಿಯ 5 ಮತ್ತು 6ನೇ ಸೆಮೆಸ್ಟರ್‌ಗಳ ಸೂಕ್ಷ್ಮ ಜೀವಶಾಸ್ತ್ರ (Microbiology)ದ SEC Theory ವಿಷಯವನ್ನು Practical ಎಂದು ಪರಿಷ್ಕರಿಸಿದ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದನೆಯನ್ನು (Pending Approval of Academic Council Meeting) ನಿರೀಕ್ಷೆಯಲ್ಲಿರಿಸಿ ಅಳವಡಿಸಲಾಗಿದೆ.

ಅದರಂತೆ, 2022–23ನೇ ಸಾಲಿನ **ಸಿ.ಬಿ.ಸಿ.ಎಸ್.** (CBCS) ಪದ್ಧತಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ 5 ಮತ್ತು 6ನೇ ಸೆಮೆಸ್ಟರ್‌ಗಳಿಗೆ ಅಳವಡಿಸಿಕೊಳ್ಳಲಾಗಿದೆ ಹಾಗೂ ಸದರ ಪಠ್ಯಕ್ರಮವನ್ನು ಕ.ವಿ.ವಿ. www.kud.ac.in ಅಂತರ್ಜಾಲದಿಂದ ಡೌನಲೋಡ ಮಾಡಿಕೊಳ್ಳಲು ಸೂಚಿಸುತ್ತಾ, ವಿದ್ಯಾರ್ಥಿಗಳ ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಎಲ್ಲ ಬೋಧಕರ ಗಮನಕ್ಕೆ ತಂದು ಅದರಂತೆ ಕಾರ್ಯಪ್ರವೃತ್ತರಾಗಲು ಕವಿವಿ ಅಧೀನದ / ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ ಸೂಚಿಸಲಾಗಿದೆ.

ಕುಲಸಚಿವರು.

ಅಡಕ: ಮೇಲಿನಂತೆ

ಗೆ,
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ. (ಕ.ವಿ.ವಿ. ಅಂರ್ತಜಾಲ ಹಾಗೂ ಮಿಂಚಂಚೆ ಮೂಲಕ ಬಿತ್ತರಿಸಲಾಗುವುದು)

ಪ್ರತಿ:

1. ಅಧ್ಯಕ್ಷರು, ಸ್ನಾತಕೋತ್ತರ ಸೂಕ್ಷ್ಮ ಜೀವಶಾಸ್ತ್ರ (Microbiology) ಅಧ್ಯಯನ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
2. ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
3. ಕುಲಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
4. ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ) ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
5. ಅಧೀಕ್ಷಕರು, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ / ಗೌಪ್ಯ / ಜಿ.ಎ.ಡಿ. / ವಿದ್ಯಾಂಡಳ (ಪಿ.ಜಿ.ಪಿಎಚ್.ಡಿ) ವಿಭಾಗ, ಸಂಬಂಧಿಸಿದ ಕೋರ್ಸುಗಳ ವಿಭಾಗಗಳು ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
6. ನಿರ್ದೇಶಕರು, ಕಾಲೇಜು ಅಭಿವೃದ್ಧಿ / ವಿದ್ಯಾರ್ಥಿ ಕಲ್ಯಾಣ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.

KARNATAKUNIVERSITY,DHARWAD

B.Sc.Programme

*****

Revised SEC Practical Syllabus (V and VI Semesters)

Microbiology(Optional)

AS SKILL ENHANCEMENT COURSE(SEC)

UNDER

CHOICE BASED CREDIT SYSTEM (CBCS)

*****

Effective from 2022-23

Karnatak University, Dharwad
CBCS syllabus for Under Graduate Programme in Microbiology (optional)
Effective from2020-21

Sem	Theory /Practical	SubjectCode	TotalTeachinghours perweek	TotalTeachinghours perSemester	Duration of Exams	InternalAssessmentMarks	Semester End ExamMarks	TotalMarks	Credits
I	**Theory**	**DSC MBT:1.1**	**04hrs**	**60**	**03hrs**	**20**	**80**	**100**	**04**
	Practical	**DSCMBP:1.1**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
II	**Theory**	**DSCMBT:2.1**	04hrs	60	03hrs	**20**	**80**	**100**	**04**
	Practical	**DSCMBP:2.1**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
III	**Theory**	**DSCMBT:3.1**	04hrs	60	03hrs	**20**	**80**	**100**	**04**
	Practical	**DSCMBP:3.1**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
IV	**Theory**	**DSCMBT:4.1**	04hrs	60	03hrs	**20**	**80**	**100**	**04**
	Practical	**DSCMBP:4.1**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
V	**Theory**	**DSEMBT:5.1AORMBT:5.1B**	04hrs	60	03hrs	**20**	**80**	**100**	**04**
	Practical	**DSEMBP: 5.1AORMBP:5.1B**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
	Practical	**SEC-1MBP:5.2A**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
	Practical	**SEC-2MBP:5.2B**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
VI	**Theory**	**DSEMBT:6.1 OR DSE MBT:6.1B**	04hrs	60	03hrs	**20**	**80**	**100**	**04**
	Practical	**DSEMBP:6.1AORMBP:6.1B**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
	Practical	**SEC-1MBP:6.2A**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
	Practical	**SEC-2MBP:6.2B**	04hrs	60	03hrs	**10**	**40**	**50**	**02**
Total						**220**	**880**	**1100**	**44**

Credit means the unit by which the course work is measured. One hour session of Lecture per week for 16 weeks amounts to1credit.Fourhourssessionof Practicals per week for 16weeksamountsto2creditspersemester.

Each DSE shall have at least two papers and student shall choose any one paper from each DSE.

SECshallbefromanyoneDSCandstudytwoeachin5th and6th semesters(SECmaybepracticalortheoryfor2creditsonly).

Note:1.EachDSC/DSEShallhave60hrssyllabus/semesterfor100marksintheory(80Sem.Endexam+20IAExam)and52hrspractical/semfor50marks(40Sem.Endexam+10IAExam)

Karnatak University, Dharwad
CBCS syllabus for Under Graduate Programme in Microbiology (opt.)as
DISCIPLINESPECIFICCOURSE(DSC)
Effectivefrom2020-21

Semester	Theory/ Practical	SubjectCode	Instructionhourperweek	Totalhours ofSyllabus /Sem	DurationofExam.	Internal Assessment Marks	SemfinalExam. Marks	Total Marks	Credits
I	Theory	DSC**MB**T:1.1	04hrs	60	03hrs	20	80	100	04
	Practical	DSC**MB**P:1.1	04hrs	52	03hrs	10	40	50	02
II	Theory	DSC**MB**T:2.1	04hrs	60	03hrs	20	80	100	04
	Practical	DSC**MB**P:2.1	04hrs	52	03hrs	10	40	50	02
III	Theory	DSC**MB**T:3.1	04hrs	60	03hrs	20	80	100	04
	Practical	DSC**MB**P:3.1	04hrs	52	03hrs	10	40	50	02
IV	Theory	DSC**MB**T:4.1	04hrs	60	03hrs	20	80	100	04
	Practical	DSC**MB**P:4.1	04hrs	52	03hrs	10	40	50	02
V	*Theory P-I/P-II	DSE**MB**T:5.1A OR **MBT**:5.1B	04hrs/ 04hrs	60/60	03hrs	20	80	100	04
	Practical	DSE**MB**P: 5.1AOR **MB**P:5.1B	04hrs/ 04hrs	52/52	03hrs	10	40	50	02
VI	*Theory P-I/P-II	DSE **MB**T: 6.1AOR **MB**T:6.1B	04hrs/ 04hrs	60/60	03hrs	20	80	100	04
	Practical	DSE**MB**P:6.1 AOR **MB**P:6.1B	04hrs/ 04hrs	52/52	03hrs	10	40	50	02
Total						180	720	900	36

*Candidate shallchooseeitherpaper–IorP-IIbutnotbothinDSEtheory.

SKILLENHANCEMENTCOURSE(SEC)forMicrobiologyoptionalDSC

Semester	Practical	Subject Code	Instruction hourper week	Totalho ursofSyl labus /Sem	DurationofE xam.	Intern alAsse ssmen tMark s	Semf inalE xam. Marks	TotalM arks	Credits
V	Practical	SEC-5.2A	04hrs	40	3hrs	10	40	50	02
V	Practical	SEC-5.2B	04hrs	40	3hrs	10	40	50	02
VI	Practical	SEC-6.2A	04hrs	40	3hrs	10	40	50	02
VI	Practical	SEC-6.2B	04hrs	40	3hrs	10	40	50	02
Total						40	160	200	08

RevisedSECPracticalSyllabus

For B.Sc. V and VI Semester

In Microbiology

SKILL ENHANCEMENT COURSES (SEC) in Microbiology
B.Sc. Semester- V(Practicals): SEC-5.2A
MICROBIAL QUALITY CONTROL IN FOOD AND INDUSTRIES
No. of Credits: 02Total Syllabus: 40 hrs / Semester Teaching hrs/ week: 04 hrs
Practical Examination: Maximum Marks: 50 (40 Semester end exam + 10 IA Exam)
Duration of Exam: 3 hrs

1. Current Good Laboratory Practices (GLP),
2. Good Manufacturing practices (GMP) and Good Documentation Practices (GDP) in Quality Control.
3. Cleaning, Disposal, Decontamination, Sanitation and Sterility in Microbiology laboratory.
4. Monitoring and Validation of Autoclave by biological and chemical indicator methods.
5. Media preparation and importance of media in pharmaceutical and food industries.
6. Growth Promotion Test (GPT) to verify the fertility of culture media.
7. Maintenance of pure cultures in quality control.
8. Resazurin test to Determine Quality of milk.
9. Litmus milk test to Determine Quality of milk.
10. Visit to Pharma, Food and food processing, alcoholic beverage Industries. Tour/Project Report should be submitted.

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER
MICROBIAL QUALITY CONTROL IN FOODAND INDUSTRIES

Duration: 3 hours **Max. Marks: 40**

Q. 1	Major question	12 Marks
Q. 2	Minor question	08 Marks
Q. 3	Identify and comment	5X2 = 10 marks
Q. 4	Tour Report/Project Report	05 Marks
Q. 5	Journal/Viva – Voce	05 Marks

References

1. Baird, R. M., Hodges, N. A. and Denyer, S. P. (2005). Handbook of Microbiological Quality control in Pharmaceutical and Medical Devices, Taylor and Francis Inc.
2. Garg, N., Garg, K. L. and Mukerji, K. G. (2010). Laboratory Manual of Food Microbiology I K International Publishing House Pvt. Ltd.
3. Harrigan, W. F. (1998). Laboratory Methods in Food Microbiology, 3rd ed. Academic Press.
4. Jay, J. M., Loessner, M. J., Golden, D. A. (2005). Modern Food Microbiology, 7th edition. Springer.

SKILL ENHANCEMENT COURSES (SEC) in Microbiology
B.Sc. Semester- V Microbiology (Practicals):SEC-5.2B
MICROBIOLOGICAL ANALYSIS OF AIR AND WATER
No. of Credits: 02 Total Syllabus: 40 hrs / Sem Teaching hrs/ week: 04 hrs
Practical Examination: Maximum Marks: 50 (40 Semester End exam + 10 IA Exam)
Duration of Exam: 3 hrs

1. Standard procedure for water sampling methods in industries
2. Standard procedure Air and Surface swab sampling methods.
3. Isolation and Enumeration of microbes from different work places.
4. Enumeration of coliform bacteria from water by Membrane Filtration technique.
5. Enumeration of Total Viable Count in water samples in Quality Control Microbiology
6. Enumeration of Specified microorganisms from water samples in industries.
7. Rapid methods to detect bacteria from water samples.
8. Environmental monitoring by passiveand active air sampling.
9. Environmental monitoring of Surface and personal hygiene swabs in industries.
10. Visit to Drinking water unit/waste water treatment plants/ETP/WTP in industries. Tour/Project Report should be submitted.

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER
MICROBIOLOGICAL ANALYSIS OF AIR AND WATER

Duration: 3 hours **Max. Marks: 40**

Q. 1	Major question	12 Marks
Q. 2	Minor question	08 Marks
Q. 3	Identify and comment	5X2 = 10 marks
Q. 4	Tour Report/Project Report	05 Marks
Q. 5	Journal&Viva – Voce	05 Marks

References

- da Silva, N., Taniwaki, M. H., Junqueira, V. C., Silveira, N., Nascimento, M. S. and Gomes, R. A. R. (2012). Microbiological Examination Methods of Food and WaterA Laboratory Manual, CRC Press.
- Atlas, R. M. and Bartha, R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA.
- Maier, R. M., Pepper, I. L. and Gerba, C. P. (2009). Environmental Microbiology. 2nd edition, Academic Press.
- Hurst, C. J, Crawford, R. L., Garland, J. L. and Lipson, D. A. (2007). Manual of Environmental Microbiology,

SKILL ENHANCEMENT COURSES (SEC) in Microbiology
B.Sc. Semester- VI Microbiology (Practicals): SEC-6.2A
MICROBIAL DIAGNOSIS IN HEALTH CLINICS
No. of Credits: 02Total Syllabus: 40 hrs/Sem Teaching hrs/ week: 04 hrs
Practical Examination: Maximum Marks: 50 (40 Semester End exam + 10 IA Exam)
Duration of Exam: 3 hrs.

1. Introduction to Safety measures and Microbiological tools for management of clinical samples.
2. Collection, Transportationand storage of clinical specimens in pathological laboratory.
3. Isolation of gut microflora on Differential culture media.
4. Analysis of different alcohol concentrations for its microbicidal effect.
5. Study of distinct and suspected colony characteristics of bacterial pathogens (by chart).
6. Determination of human pathogens by Serological tests.
7. Microbial Analysis of Wound samples.
8. Isolation of bacteria from Urine and Blood samples.
9. Acid-Fast Staining technique for study of Mycobacterium.
10. Internship/In-plant training/Lab Training/Mini project for the students in association with medical, clinical research institute, pathological and testing laboratories. Report should be submitted.

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER
MICROBIAL DIAGNOSIS IN HEALTH CLINICS

Duration: 3 hours **Max. Marks: 40**

Q. 1	Major question	12 Marks
Q. 2	Minor question	08 Marks
Q. 3	Identify and comment	5X2 = 10 marks
Q. 4	Training/Internship Report	05 Marks
Q. 5	Journal&Viva – Voce	05 Marks

References:

- Ananthanarayan, R. and Paniker, C. K. J. (2009). Textbook of Microbiology, 8th edition, Universities Press Pvt. Ltd.
- Brooks, G.F., Carroll, K.C., Butel, J.S., Morse, S.A. and Mietzner, T.A. (2013).
- Jawetz,Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication.
- Randhawa, V. S., Mehta, G. and Sharma, K. B. (2009). Practicals and Viva in Medical Microbiology 2nd edition, Elsevier India Pvt. Ltd.
- Tille, P. (2013) Bailey's and Scott's Diagnostic Microbiology, 13th edition, Mosby.
- Collee, J. G., Fraser, A. G., Marmion, B. P. and Simmons, A. (2007). Mackie and Mccartney Practical Medical Microbiology, 14th edition, Elsevier.

SKILL ENHANCEMENT COURSES (SEC) in Microbiology

B.Sc. Semester- VI Microbiology (Practicals): SEC-6.2B

MICROBIAL INFECTIONS AND TREATMENT

No. Of Credits: 02Total Syllabus: 40 hrs / Sem Teaching hrs/ week: 04 hrs

Practical Examination: Maximum Marks: 50 (40 Semester End exam + 10 IA Exam)

Duration of Exam: 3 hrs

1. Isolation of Bacteria from nose and ear discharge samples.
2. Direct microscopic observation of fungi from clinical samples – Dandruff and Ringworm infection.
3. Antimicrobial assay byAgar well/Disk diffusion method.
4. Determination of MIC and MBC.
5. WBC differential count with correlation of clinical sample.
6. Identification of pathogens using multiset system by API (by chart).
7. Isolation and KOH mount of Fungi from Clinical sample.
8. Study of epidemic outbreaks SARS/ Swine flu/ Ebola/Corona (By chart).
9. Study on vaccination schedule (compulsory and preventive) (By chart).
10. Visit to Medical and Clinical Research institute/Pathological laboratories/Diagnostic centers/Testing Laboratories. Tour/Project Report should be submitted.

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER
MICROBIAL INFECTIONS AND TREATMENT

Duration: 3 hours **Max. Marks: 40**

Q. 1	Major question	12 Marks
Q. 2	Minor question	08 Marks
Q. 3	Identify and comment	5X2 = 10 marks
Q. 4	Tour Report/Project Report	05 Marks
Q. 5	Journal&Viva – Voce	05 Marks

REFERENCES

1. Ananthanarayan, R. and Paniker, C.K.J. (2018). Textbook of Microbiology. 8th edition, University Press Publication.
2. Brooks, G.F., Carroll, K.C., Butel, J.S., Morse, S.A. and Mietzner, T.A. (2013). Jawetz,
3. Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication.
4. Goering, R., Dockrell, H., Zuckerman, M. and Wakelin, D. (2007). Mims' Medical Microbiology. 4th edition. Elsevier.
5. Willey, J. M., Sherwood, L. M. and Woolverton, C. J. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education.
6. Madigan, M. T., Martinko, J. M., Dunlap, P. V. and Clark, D. P. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition.