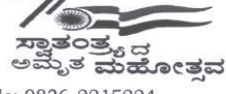




KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ



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./2022-23/1352

Date: 29 NOV 2022

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2022-23ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿಗಾಗಿ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಅಡಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ ಸ್ನಾತಕ ಅನ್ವಯಿಕ ತಳಿಶಾಸ್ತ್ರ (Applied Genetics) ಪದವಿಯ 5 ಮತ್ತು 6ನೇ ಸೆಮೆಸ್ಟರ್‌ನ SEC ಸೈದ್ಧಾಂತಿಕ ಪತ್ರಿಕೆಯ ಬದಲಾಗಿ ಪ್ರಾಯೋಗಿಕ ಪತ್ರಿಕೆಯಾಗಿ ಪಠ್ಯಕ್ರಮದಲ್ಲಿ ಪರಿವರ್ತಿಸಿ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

- ಉಲ್ಲೇಖ: 1. ವಿಶೇಷ ಅಡ್-ಹಾಕ್ ಸಮಿತಿ ಸಭೆಯ 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 ಅನ್ವಯಿಕ ತಳಿಶಾಸ್ತ್ರ (Applied Genetics)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 ಡೌನ್‌ಲೋಡ್ ಮಾಡಿಕೊಳ್ಳಲು ಸೂಚಿಸುತ್ತಾ, ವಿದ್ಯಾರ್ಥಿಗಳ ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಎಲ್ಲ ಬೋಧಕರ ಗಮನಕ್ಕೆ ತಂದು ಅದರಂತೆ ಕಾರ್ಯಪ್ರವೃತ್ತರಾಗಲು ಕವಿವಿ ಅಧೀನದ / ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ ಸೂಚಿಸಲಾಗಿದೆ.

ಅಡಕ: ಮೇಲಿನಂತೆ


ಕುಲಸಚಿವರು.

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

ಪ್ರತಿ:

1. ಅಧ್ಯಕ್ಷರು, ಸ್ನಾತಕೋತ್ತರ ಅನ್ವಯಿಕ ತಳಿಶಾಸ್ತ್ರ (Applied Genetics) 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.ಪಿ.ಎಚ್.ಡಿ) ವಿಭಾಗ, ಸಂಬಂಧಿಸಿದ ಕೋರ್ಸುಗಳ ವಿಭಾಗಗಳು ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
6. ನಿರ್ದೇಶಕರು, ಕಾಲೇಜು ಅಭಿವೃದ್ಧಿ / ವಿದ್ಯಾರ್ಥಿ ಕಲ್ಯಾಣ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.



KARNATAK UNIVERSITY, DHARWAD

B.Sc. Programme

Revised SEC Practical Syllabus

(V and VI Semesters)

Genetics (Optional)

AS SKILL ENHANCEMENT COURSE (SEC)

UNDER

CHOICE BASED CREDIT SYSTEM (CBCS)

Effective from 2020-21

Karnatak University, Dharwad

CBCS syllabus for Under Graduate Programme in Genetics (optional)

Effective from 2020-21

| Sem | Theory /Practical | SubjectCode | Total Teaching hours per week | Total Teaching hours per Semester | Duration of Exams | Internal Assessment Marks | Semester End Exam Marks | Total Marks | Credits |
|--------------|-------------------|-------------------------------|-------------------------------|-----------------------------------|-------------------|---------------------------|-------------------------|-------------|-----------|
| I | Theory | DSC GENT:1.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSC GENP:1.1 | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| II | Theory | DSC GENT:2.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSC GENP:2.1 | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| III | Theory | DSC GENT:3.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSC GENP:3.1 | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| IV | Theory | DSC GENT:4.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSC GENP:4.1 | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| V | Theory | DSE GENT:5.1A OR GENT:5.1B | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSE GENP: 5.1A OR GENP: 5.1B | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| | Practical | SEC-1GENP:5.2A | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| | Practical | SEC-2GENP:5.2B | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| VI | Theory | DSE GENT:6.1AOR DSE GENT:6.1B | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSE GENP:6.1A OR GENP:6.1B | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| | Practical | SEC-1GENP:6.2A | 04hrs | 60 | 03hrs | 10 | 40 | 50 | 02 |
| | Practical | SEC-2GENP: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 to 1 credit. Four hours session of Practicals per week for 16 weeks amounts to 2 credits per semester.

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

SEC shall be from any one DSC and study two each in 5th and 6th semesters (SEC maybe practical or theory for 2 credits only).

Note:1.Each DSC/DSE Shall have 60hrs syllabus/semester for 100 marks in theory (80Sem.End exam+20 IA Exam) and 52hrs practical/sem for 50marks (40 Sem.End exam+10 IA Exam).

Karnatak University, Dharwad

CBCS syllabus for Under Graduate Programme in Genetics (opt.)as

DISCIPLINE SPECIFIC COURSE (DSC)

Effective from 2020-21

| Sem ester | Theory/ Practical | Subject Code | Instruction hour per week | Total hours of Syllabus /Sem | Duration of Exam. | Internal Assessment Marks | Sem final Exam Marks | Total Marks | Credits |
|-----------|-------------------|----------------------------------|---------------------------|------------------------------|-------------------|---------------------------|----------------------|-------------|---------|
| I | Theory | DSCGENT:1.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSCGENP:1.1 | 04hrs | 52 | 03hrs | 10 | 40 | 50 | 02 |
| II | Theory | DSCGENT:2.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSCGENP:2.1 | 04hrs | 52 | 03hrs | 10 | 40 | 50 | 02 |
| III | Theory | DSCGENT:3.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSCGENP:3.1 | 04hrs | 52 | 03hrs | 10 | 40 | 50 | 02 |
| IV | Theory | DSCGENT:4.1 | 04hrs | 60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSCGENP:4.1 | 04hrs | 52 | 03hrs | 10 | 40 | 50 | 02 |
| V | *Theory P-I/P-II | DSE GENT:5.1 AOR GENT:5.1B | 04hrs/ 04hrs | 60/60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSEGENP: 5.1AOR GENP:5.1B | 04hrs/ 04hrs | 52/52 | 03hrs | 10 | 40 | 50 | 02 |
| VI | *Theory P-I/P-II | DSE GENT: 6.1AOR GENT:6.1B | 04hrs/ 04hrs | 60/60 | 03hrs | 20 | 80 | 100 | 04 |
| | Practical | DSEGENP:6. 1AOR GENP:6.1B | 04hrs/ 04hrs | 52/52 | 03hrs | 10 | 40 | 50 | 02 |
| Total | | | | | | 180 | 720 | 900 | 36 |

*Candidate shall choose either paper-I or P-II but not both in DSE theory.

SKILL ENHANCEMENT COURSE (SEC) for GENETICS optional DSC

| Semester | Practical | Subject Code | Instruction hour per week | Total hours of Syllabus /Sem | Duration of Exam. | Internal Assessment Marks | Semfinal Exam. Marks | Total Marks | 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 |

Revised SEC Practical Syllabus
(B.Sc. V and VI Semester)
In Genetics

SKILL ENHANCEMENT COURSES (SEC) IN GENETICS

B.Sc. Semester-V (Practicals): SEC-5.2A

CELL BIOLOGY TECHNIQUES

No. of Credits:02

Total Syllabus:40hrs/Semester Teaching hrs/week:04hrs

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

Duration of Exam:3hrs

1. Preparation of various reagents for Cytology (Stains, Pre-treating agents , Fixatives etc.)
2. Preparation of Cytological slides for Karyotypic studies from Plant/Animal material.
3. Preparation of Permanent slides.
4. Karyotype analysis and Assessment of Chromosome evolution.
5. Study of Translocation Heterozygote using plant samples.
6. Induction of Chromosomal mutations and Analysis.
7. Study of Special type Chromosomes (Polytene chromosome , B-Chromosomes)
8. Chromosome Painting (Q-Banding, C-Banding and NOR-Banding).
9. Identification of Chromosome anomalies using Idiograms-X-Linked disorders (Kleinfelter's, Down's , Turner's Syndrome).

SCHEME OF PRACTICAL EXAMINATION V SEMESTER

CELL BIOLOGY TECHNIQUES

Duration : 03 hrs.

Max. Marks: 40

| | |
|----------------------|----------------------------|
| 1. Question | Major 10 Marks |
| 2. Minor Question. | 08 Marks |
| 3. comment. | Identify and 12 Marks |
| 4. Project report | Tour report or 05 Marks |
| 5. Journal | Viva-voce/ 05 marks |

REFERENCE BOOKS:

1. Singh,R,J.(2017).Practical manual on Plant cytogenetics.CRC press
2. Lavania, U.C.(2018).Practical manual on plant cytogenetics. Springer.
3. Arsham ,M.S Barch ,M.J. ,and Lawce , H.J. (Eds.). (2017). The AGT Cytogenetics laboratory manual.John Wiley and sons.

4. Singh, R. J. (2016). *Plant cytogenetics*. CRC Press.
5. Ashburner, M. (1989). *Drosophila – A Laboratory handbook*. Cold Spring Harbor Laboratory Press.

SKILL ENHANCEMENT COURSES (SEC) in Genetics
B.Sc. Semester-V Genetics (Practicals): SEC-5.2B

BIOINFORMATICS AND BIOSTATISTICS

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

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

Duration of Exam: 3hrs

1. Sequence similarity searching using **BLAST**.
2. Multiple sequence alignment using **clustal-W**.
3. Restriction analysis using **NEBCUTTER**.
4. ORF finding using **NCBI-ORF Finder**.
5. Protein Structure visualization using **RASMOL**.
6. Protein Structure visualization using **Cn3D**.
7. Data search and retrieval using **Pubmed**.
8. Study of Inherited Diseases by using **OMIM**.
9. Study of Central tendency.
10. Study of Measures of dispersion.
11. Study of Correlation and Regression.

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER

BIOINFORMATICS AND BIOSTATISTICS ANALYSIS OF AIR AND WATER

Duration: 3 hours

Max. Marks: 40

| | |
|----------------------|----------------------------|
| 1. Question | Major 10 Marks |
| 2. Minor Question. | 08 Marks |
| 3. comment. | Identify and 12 Marks |
| 4. Project report | Tour report or 05 Marks |
| 5. Journal | Viva-voce/ 05 marks |

REFERENCE BOOKS:

1. Bioinformatics computing-Bryan,1 MD. Pearsons education
2. Bioinformatics-C.S.V. Murthy Himalaya publishing house.
3. Introduction to Bioinformatics – Attwood and Parry-Smith.,Pearson Education. Asia.
4. D.J.Finney (1978) : Statistical methods in Biological assays, Charls Griffikics and Company.

5. A.P.Gore and S.A.Paranjpe (2000) : A course in mathematical and statistical ecology, Kluwar.
R.C.Elandt Johanson (1975) : Probability models and statistical methods in Genetics Wiley.

SKILL ENHANCEMENT COURSES (SEC) IN GENETICS
B.Sc. Semester-VI Genetics (Practicals) : SEC-6.2A

APPLIED GENETICS

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

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

Duration of Exam: 3hrs

1. Extraction of DNA from plant and Animal samples.
2. Quantification of DNA by Spectrophotometer /Migration on Agarose Gel
3. Estimation of DNA by DPA method.
4. Electrophoretic separation of DNA using agarose Gel.
5. Extraction of RNA from plant and animal samples.
6. Estimation of RNA by Orcinol method.
7. Extraction of Protein from Plant and Animal Samples.
8. Estimation of Proteins by CBB method.
9. Polymerase Chain Reaction
10. Electrophoretic Separation of Proteins using SDS-PAGE

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER

APPLIED GENETICS

Duration: 3 hours

Max. Marks: 40

| | | |
|------|-------------------------|----------------|
| Q. 1 | Major question | 10 Marks |
| Q. 2 | Minor question | 08 Marks |
| Q. 3 | Identify and comment | 6X2 = 12 marks |
| Q. 4 | Training/Project Report | 05 Marks |
| Q. 5 | Viva – Voce/ Journal | 05 Marks |

REFERNCE BOOKS:

1. Brooker R.J.1999, Genetic analysis and Priciples ,Benjamin/Cummings; Long man Inc.
2. Griffith A.J.F., J.H.Miller.,D.T Suzuki., R.C.Lewontin and W.M.Gilbert.1996.An Introduction to genetic analysis.W.H freeman and Company .Newyork.
3. Snustard D.P and M.J Simmons 1997,Principles of Genetics , John Wiley and Sons Inc. NY.
4. Lewin .B.2000.Gene VII Oxford university press, Oxford Newyork,Tokiyo

SKILL ENHANCEMENT COURSES (SEC) IN GENETICS

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

MICROBIAL GENETICS

No. Of Credits:02

Total Syllabus:40hrs/Sem

Teaching hrs/week:04hrs

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

Duration of Exam: 3hrs

1. Safety measures in laboratory
2. Preparation of Nutrient media
3. Isolation of Microorganisms from Air, Water.
4. Microbial Staining – Simple and Differential staining.
5. Microbial fermentation of Wine.
6. Fermentation of Sauerkraut to produce Lactic acid.
7. Cultivation of Oyster mushroom.
8. Bacterial Conjugation.
9. Isolation of Plasmid DNA from bacteria.

SCHEME OF PRACTICAL EXAMINATION FOR BSc V SEMESTER

MICROBIAL GENETICS

Duration: 3 hours

Max. Marks: 40

| | | |
|------|----------------------------|----------------|
| Q. 1 | Major question | 10 Marks |
| Q. 2 | Minor question | 08 Marks |
| Q. 3 | Identify and comment | 6X2 = 12 marks |
| Q. 4 | Tour Report/Project Report | 05 Marks |
| Q. 5 | Viva – Voce / Journal | 05 Marks |

REFERENCE BOOKS:

1. Jain, A., Jain, R., and Jain, S. (2020) basic techniques in Biochemistry and Microbiology.
2. Gerad j. Tortora, Berdell R. Funke and Christine L. case Microbiology 13 Edition.