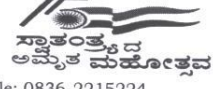




KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ



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

1197

Date: 27 OCT 2022

ಅಧಿಸೂಚನೆ

- ವಿಷಯ: 2022-23ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿಗಾಗಿ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. ಅಡಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ ಸ್ನಾತಕ ಪ್ರಾಣಿಶಾಸ್ತ್ರ ಪದವಿಯು 5 ಮತ್ತು 6ನೇ ಸೆಮಿಸ್ಟರ್‌ನ SEC ಸೈದ್ಧಾಂತಿಕ ಪತ್ರಿಕೆಯ ಬದಲಾಗಿ ಪ್ರಾಯೋಗಿಕ ಪತ್ರಿಕೆಯಾಗಿ ಪಠ್ಯಕ್ರಮದಲ್ಲಿ ಪರಿವರ್ತಿಸಿ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.
- ಉಲ್ಲೇಖ: 1. ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯ ಸಂ. 26, ದಿನಾಂಕ: 17.09.2022
2. ಅಧ್ಯಕ್ಷರು, ಸ್ನಾತಕ ಪ್ರಾಣಿಶಾಸ್ತ್ರ ವಿಶೇಷ ಅಭ್ಯಾಸಸೂಚಿ ಮಂಡಳಿ ಪತ್ರ ದಿ: 17.10.2022
3. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ: 24-10-2022

ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳನ್ವಯ ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶದ ಮೇರೆಗೆ, 2022-23ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿಗಾಗಿ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. (CBCS) ಅಡಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ ಸ್ನಾತಕ ಪದವಿಯು 5 ಮತ್ತು 6ನೇ ಸೆಮಿಸ್ಟರ್‌ಗಳ ಪ್ರಾಣಿಶಾಸ್ತ್ರದ SEC Theory ವಿಷಯವನ್ನು Practical ಎಂದು ಪರಿಷ್ಕರಿಸಿದ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದನೆಯನ್ನು (Pending Approval of Academic Council Meeting) ನಿರೀಕ್ಷೆಯಲ್ಲಿರಿಸಿ ಅಳವಡಿಸಲಾಗಿದೆ.

2022-23ನೇ ಸಾಲಿನ ಸಿ.ಬಿ.ಸಿ.ಎಸ್. (CBCS) ಪದ್ಧತಿಯಲ್ಲಿ ಜಾರಿಯಲ್ಲಿರುವ 5 ಮತ್ತು 6ನೇ ಸೆಮಿಸ್ಟರ್‌ಗಳಿಗೆ 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 ಪ್ರಾಣಿಶಾಸ್ತ್ರ ಹಾಗೂ ಸಸ್ಯಶಾಸ್ತ್ರ 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))

ZOOLOGY (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 Zoology (optional)
Effective from 2020-21

Sem	Theory / Practical	Subject Code	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 ZOOT: 1.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 1.1	04 hrs	60	03 hrs	10	40	50	02
II	Theory	DSC ZOOT: 2.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 2.1	04 hrs	60	03 hrs	10	40	50	02
III	Theory	DSC ZOOT: 3.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 3.1	04 hrs	60	03 hrs	10	40	50	02
IV	Theory	DSC ZOOT: 4.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 4.1	04 hrs	60	03 hrs	10	40	50	02
V	Theory	DSE ZOOT: 5.1A OR ZOOT: 5.1B	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSE ZOOP: 5.1AOR ZOOP:5.1B	04 hrs	60	03 hrs	10	40	50	02
	Practical	SEC-1 ZOOP: 5.2A	04 hrs	60	03 hrs	10	40	50	02
	Practical	SEC-2 ZOOP: 5.2B	04 hrs	60	03 hrs	10	40	50	02
VI	Theory	DSE ZOOT: 6.1A OR DSE ZOOT: 6.1B	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSE ZOOP: 6.1A OR ZOOP: 6.1B	04 hrs	60	03 hrs	10	40	50	02
	Practical	SEC-1 ZOOP: 6.2A	04 hrs	60	03 hrs	10	40	50	02
	Practical	SEC-2 ZOOP: 6.2B	04 hrs	60	03 hrs	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 \(SEC may be practical or theory for 2 credits only\).](#)

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

Karnatak University, Dharwad
CBCS syllabus for Under Graduate Programme in Zoology (opt.) as
DISCIPLINE SPECIFIC COURSE (DSC)
Effective from 2020-21

Sem ester	Theory/ Practical	SubjectCode	Instructio nhour per week	Total hours of Syllabus / Sem	Durationof Exam.	Internal Assess ment Marks	Sem final Exam. Marks	Total Marks	Credits
I	Theory	DSC ZOOT: 1.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 1.1	04 hrs	52	03 hrs	10	40	50	02
II	Theory	DSC ZOOT: 2.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 2.1	04 hrs	52	03 hrs	10	40	50	02
III	Theory	DSC ZOOT: 3.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 3.1	04 hrs	52	03 hrs	10	40	50	02
IV	Theory	DSC ZOOT: 4.1	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ZOOP: 4.1	04 hrs	52	03 hrs	10	40	50	02
V	*Theory P-I/P- II	DSE ZOOT: 5.1A OR ZOOT: 5.1B	04 hrs / 04 hrs	60/60	03 hrs	20	80	100	04
	Practical	DSE ZOOP: 5.1A OR ZOOP:5.1B	04 hrs/ 04 hrs	52/52	03 hrs	10	40	50	02
VI	*Theory P-I/P- II	DSE ZOOT: 6.1A OR ZOOT: 6.1B	04 hrs / 04 hrs	60/60	03 hrs	20	80	100	04
	Practical	DSE ZOOP: 6.1A OR ZOOP:6.1B	04 hrs/ 04 hrs	52/52	03 hrs	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 Zoology optional DSC

Semester	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
V	Practical	SEC-5.2A	04 hrs	40	3 hrs	10	40	50	02
V	Practical	SEC-5.2B	04 hrs	40	3 hrs	10	40	50	02
VI	Practical	SEC-6.2A	04 hrs	40	3 hrs	10	40	50	02
VI	Practical	SEC-6.2B	04 hrs	40	3 hrs	10	40	50	02
Total						40	160	200	08

Revised SEC Practical Syllabus (B.Sc. V and VI Semester) in Zoology

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

IMMUNOLOGY

No. of Credits: 02 **Total 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. Identification of blood groups (Testing) / Blood groups typing
2. Identification of cells in a blood smear
3. Estimation of Total Erythrocyte Count
4. Estimation of Differential Leukocyte Count
5. Estimation of *Salmonella species* using Widal Test
6. Estimation of inflammation using Erythrocyte Sedimentation Rate (ESR) Test
7. Study of structure and function of primary and secondary Lymphoid organs (Charts and Models)
8. Study of structure and function of Antigens (Charts and Models)
9. Study of structure and function of Immunoglobulins (Charts and Models)
10. Study of vaccines and its types (Charts and Models)
11. Study of Polymerase Chain Reaction (RT-PCR) and types (Charts)
12. Study of Enzyme Linked Immuno-Sorbent Assay (ELISA). (Charts)
13. Study of Radio Immune Assay (RIA)(Charts)

SCHEME OF PRACTICAL EXAMINATION V SEMESTER (IMMUNOLOGY)

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1. Identification of blood groups/Blood cells in smear/Total Erythrocyte count | 10 Marks |
| 2. Estimation of Differential Leukocyte Count/ <i>Salmonella species</i> using Widal Test/
Inflammation using Erythrocyte Sedimentation Rate (ESR) Test | 08 Marks |
| 3. Identification (A – F) | 12 Marks |
| 4. Viva - voce | 05 Marks |
| 5. Journal | <u>05 Marks</u> |
| TOTAL | 40 MARKS |

REFERENCE BOOKS:

1. Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). Immunology, VI Edition. W.H. Freeman and Company.
2. David, M., Jonathan, B., David, R. B. and Ivan R. (2006). Immunology, VII Edition, Mosby, Elsevier Publication.
3. Abbas, K. Abul and Lechtman H. Andrew (2003.) Cellular and Molecular Immunology. V Edition. Saunders Publication.
4. Janeway's Immunobiology
5. Kuby Immunology

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

APICULTURE

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. Study of general characters and anatomy of honey bee
2. Study of life cycle of honey bee
3. Mounting of mouth parts/sting apparatus of honey bee
4. Study of castes in honey bees
5. Identification of honey bee species
6. Study of social organization in honey bees
7. Study of Beekeeping equipments (Charts)
8. Study of honey bee by products and their uses (Charts)
9. Study of Diseases and pests of honeybees (Charts)
10. Field study/Project report on nearby apiary/bee keeping unit

SCHEME OF PRACTICAL EXAMINATION V SEMESTER (APICULTURE)

1. General characters and anatomy of honey bee/ Life cycle of honey bee	08 Marks
2. Honey bees: Mouth parts / Species /Social Organization in honey bees	04 Marks
3. Identification (A – D)	08 Marks
4. Project Report/Field Study	10 Marks
5. Viva - voce	05 Marks
6. Journal	<u>05 Marks</u>
TOTAL	40 MARKS

REFERENCE BOOKS:

1. Prost, P. J. Apiculture. Oxford and IBH, New Delhi.
2. Bisht D.S. Apiculture, ICAR Publication.
3. Bisht, D.S. Agricultural Development in India, Anmol Pub. Pvt. Ltd.
4. Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi
5. Mehrotra, K.N. Bisht, D.S. Twenty-five years of apiculture research at IARI.

SKILL ENHANCEMENT COURSES (SEC) in Zoology
B.Sc. Semester- VI
Zoology (Practicals): SEC-6.2A

INSECT VECTORS AND DISEASES

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. Preparation of key for identification of insect vectors
2. General characters and morphology of insect vectors
3. Mounting of mouth parts of Insects
4. Study of types of antennae in insect vectors
5. Study of mechanical and biological insect vectors
6. Study, prevention and control of arbo-viral diseases transmitted by mosquito
7. Study, prevention and control of diseases transmitted by houseflies
8. Study, prevention and control of diseases transmitted by fleas/lice/bugs
9. Study of endoparasites in insect vectors
10. Study of insect vectors as ecto-parasites
11. Project report on Insects as disease vectors /Local insect vector collection, taxonomy and preservation

SCHEME OF PRACTICAL EXAMINATION VI SEMESTER (INSECT VECTORS AND DISEASES)

1. General characters/Morphology/Key preparation of insect vectors	08 Marks
2. Insect/Vectors: Mounting of Mouth parts / antennae	04 Marks
3. Identification (A - D)	08 Marks
4. Project Report	10 Marks
5. Viva - voce	05 Marks
6. Journal	<u>05 Marks</u>

TOTAL 40 MARKS

REFERENCE BOOKS:

1. Imms A general text book of Entomology. Chapman & Hall UK
2. Chapman The insects: Structure and function. IV Edition, Cambridge University Press, UK
3. Pedigo Entomology and Pest Management. Prentice Hall Publication.
4. Mathews, G. (2011). Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases. Wiley-Blackwell

SKILL ENHANCEMENT COURSES (SEC) in Zoology
B.Sc. Semester- VI
Zoology (Practicals): SEC-6.2B

AQUARIUM FISH KEEPING

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. Study of external morphology and morphometry of aquarium fish.
2. Aquarium Water analysis (Dissolved oxygen, carbon dioxide, alkalinity, salinity, pH, hardness)
3. Mounting of scales and fins of aquarium fish
4. Study of various local ornamental fishes (any five)
5. Museum/specimen study / classification and general characters of indigenous and exotic aquarium fish species - Freshwater (Guppy, Molly, Angel fish, Gold fish, Blue morph,) Brackish (Sword tail) Marine (Anemone fish, Butterfly fish).
6. Study of construction of fish Aquarium
7. Study of set-up and maintenance of fish aquarium and devices
8. Formulation of diet for aquarium fishes (available commercial fish feeds)
9. Preparation of powdered and pelleted feed for ornamental fishes
10. Identification of ornamental aquatic plants (any five)
11. Study of bacterial, viral and fungal (one from each group) diseases of ornamental fishes and their control
12. Transport and handling techniques of aquarium fishes

SCHEME OF PRACTICAL EXAMINATION VI SEMESTER (AQUARIUM FISH KEEPING)

- | | |
|-------------------------------------------------------------------------|------------------------|
| 1. Morphology and morphometry of aquarium fish/ Aquarium water analysis | 10 Marks |
| 2. Mounting (scales / fins) | 06 Marks |
| 3. Identification (A – G) | 14 Marks |
| 4. Viva - voce | 05 Marks |
| 5. Journal | <u>05 Marks</u> |

TOTAL

40 MARKS

REFERENCE BOOKS:

1. Aquarium : Fish Keeping C B L Srivastava Published by Kitab Mahal
2. Marine Aquarium Boruchowitz, Davie. Published by Chelsea House Publications
3. Aquarium Setting Up Axelrod, Herbert R. Published by Chelsea House Publications
4. The Tropical Freshwater Aquarium Problem Solver: Practical and Expert Advice on Keeping Fish and Plants Sand ford, Gina Published by Voyageur Press (MN)
5. Mitchell Beazley, The complete guide to tropical aquarium fish care. Read and Consumes Book Ltd., London