



हिमाचल प्रदेश केन्द्रीय विश्वविद्यालय

Central University of Himachal Pradesh

(Established under Central Universities Act 2009)

अस्थाई शैक्षणिक खण्ड, शाहपुर, ज़िला काँगड़ा, हिमाचल प्रदेश - 176206
Temporary Academic Block, Shahpur, Distt. Kangra (HP) - 176206
Website: www.cuhimachal.ac.in

फ़ाइल संख्या: जन्तु विज्ञान/1-5/पाठ्य समिति/हि.प्र.के.वि./18/ *SKS*

दिनांक: 09.09.2020

MINUTES OF THE 2nd BOARD OF STUDIES MEETING HELD ON 9th SEPTEMBER, 2020

The **meeting** of the 2nd Board of Studies of the Department of Animal Sciences, School of Life Sciences, Central University of Himachal Pradesh, Dharamshala, HP was held through **online mode** on Cisco Webex {<https://meetingsapac20.webex.com/meetingsapac20/j.php?MTID=ma8d1c821600bac0e6fa869844d9c1bdc>, Meeting number (access code): 170 432 7156, Meeting password: pKHdFqPG858 (75433774 from video systems)} on 9th September, 2020 at 11:00 AM. During the meeting, the Subject Experts were available on Cisco Webex and all other members were present in the Seminar Hall, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur. Dr. Sunil Kumar, Associate Professor & Head, Department of Animal Sciences Chaired the meeting.

Following members attended the meeting:

1. Dr. Sunil Kumar - **Head and Convener**
Head, Department of Animal Sciences,
Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
2. Dr. Yogesh Kumar Rawal – **Subject Expert**
Department of Zoology, Panjab University, Chandigarh.
3. Dr. Pawan Sharma – **Subject Expert**
Department of Entomology, CSKHPKV, Palampur.
4. Dr. Mahesh Kulharia – **Vice Chancellor's Nominee**
Associate Professor & Director, Centre for Computational Biology and Bioinformatics, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
5. Dr. Vikram Singh – **Vice Chancellor's Nominee**
Assistant Professor, Centre for Computational Biology and Bioinformatics, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
6. Dr. Rishi Thakur – **Dean's Nominee**
Assistant Professor, Department of Plant Sciences, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
7. Dr. Rakesh Kumar – **Member**
Assistant Professor, Department of Animal Sciences, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
8. Dr. Tarkeshwar – **Special Invitee**
Assistant Professor, Department of Animal Sciences, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
9. Dr. Ranjit Kumar – **Special Invitee**
Assistant Professor, Department of Animal Sciences, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.

Signature
9/9/2020

Signature
09/09/2020

Page 1 of *Signature*
09/09/2020

Signature
09.09.2020

Signature
09/09/2020

The **Chairman** welcomed all the **Hon'ble members** and briefed about the **past activities** and also about the various **agenda items** to be **discussed** in the **meeting** which were **sent in advance** to all members through **e-mail** including **out-side experts**. Various **Agenda Items** were **placed** before the **committee** and after **detailed discussion and deliberations** on each, the **following decisions** were taken:

AGENDA ITEM NO. – ANS-BOS-2/20-1

Approval of the Minutes of the 1st Board of Studies meeting held on 10.05.2018 attached as Annexure I.

Decision:

The Minutes of the first meeting of the BoS were Approved

Agenda Item No. - ANS-BOS-2/20-2

Proposal for Restructure of the Course Curriculum and addition of New Courses for the M.Sc. Zoology in the CBCS format (for 2020 Batch onwards) as given in Annexure -II.

Suggestions':

The proposal for restructuring of the current course curriculum was placed before the BoS in view of the requirement for imparting better knowledge and practical skills to the students with justification. The members deliberated upon the tabled new structure as recommended by the Departmental Council of Department of Animal Sciences, CUHP and suggested several changes for betterment. It was suggested that in the beginning foundation courses be preferred and thereafter as the students gain basic knowledge, gradually advanced and application-oriented courses be provided. In addition, the course curriculum must contain the components of skill, more hands-on training during practicals and also exposure to advanced fields so that they can help to contribute in various related fields/disciplines in future. Finally, after detailed deliberations, the new course curriculum with addition of few new courses and modification of others courses was recommended for Masters Degree of M.Sc. Zoology in the CBCS format (for 2020 Batch onwards) as per the detail given below and in Annexure -II.

Semester - 1

| Sr. No. | Course Code | Course Name | Credits |
|---|-------------|---|---------|
| Core Compulsory (14 credits) | | | |
| 1 | ZOO 401 | Cellular and Molecular Biology | 4 |
| 2 | ZOO 402 | Invertebrate Biology | 2 |
| 3 | ZOO 403 | Animal Taxonomy | 4 |
| 4 | ZOO 404 | Cellular & Molecular Biology and Invertebrate Biology - LAB | 2 |
| 5 | ZOO 405 | Animal Taxonomy and Histological Techniques - LAB | 2 |
| Core Open/Elective Open (02 credits) | | | |
| 6 | ZOO 406 | Ecology and Environment | 2 |
| 7 | ZOO 407 | Histology and Histochemistry | 2 |
| 8 | ZOO 408 | Chronobiology | 2 |

Handwritten signatures and dates:
 19/05/2020, 05/05/2020, 09/09/2020, 09/09/2020, 09/09/2020, 09/09/2020




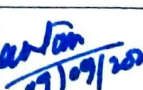
| Foundation Courses (Human Making, 02 credits) | | | |
|--|---------|--------------------------------|---|
| 9 | ZOO 409 | Sericulture and Apiculture | 2 |
| Foundation Courses (Skill Development, 02 credits) | | | |
| 10 | ZOO 410 | Advanced Techniques in Biology | 2 |

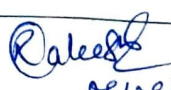
Semester – 2

| Sr. No. | Course Code | Course Name | Credits |
|--|-------------|--|---------|
| Core Compulsory (12 credits) | | | |
| 1 | ZOO 451 | Cytogenetics | 4 |
| 2 | ZOO 452 | Principles of Biochemistry | 2 |
| 3 | ZOO 453 | Functional Anatomy of Chordates | 2 |
| 4 | ZOO 454 | Cytogenetics and Principles of Biochemistry - LAB | 2 |
| 5 | ZOO 455 | Functional Anatomy of Chordates and Fundamentals in Microbiology - LAB | 2 |
| Core Open/Elective Open (04 credits) | | | |
| 6 | ZOO 456 | Biostatistics and Bioinformatics | 2 |
| 7 | ZOO 457 | Fundamentals in Microbiology | 2 |
| 8 | ZOO 458 | Evolution | 2 |
| 9 | ZOO 459 | Comparative Physiology | 2 |
| Foundation Courses (Human Making, 02 credits) | | | |
| 9 | ZOO 460 | Aquaculture | 2 |
| Foundation Courses (Skill Development, 02 credits) | | | |
| 10 | ZOO 461 | Fundamentals of Wild Life | 2 |

Semester – 3

| Sr. No. | Course Code | Course Name | Credits |
|--------------------------------------|-------------|--|---------|
| Core Compulsory (08 credits) | | | |
| 1 | ZOO 501 | Entomology | 2 |
| 2 | ZOO 502 | Immunology | 4 |
| 3 | ZOO 503 | Ichthyology | 2 |
| Core Open/Elective Open (04 credits) | | | |
| 4 | ZOO 504 | Animal Behavior | 2 |
| 5 | ZOO 505 | Animal Biodiversity | 2 |
| 6 | ZOO 506 | Animal Biotechnology | 2 |
| 7 | ZOO 507 | Medical Biochemistry and Health | 2 |
| Elective Specialization (08 credits) | | | |
| Entomology | | | |
| 8 | ZOO 508 | Pesticides Hazards and Environment | 2 |
| 9 | ZOO 509 | Advances in Entomology and Pest Management | 2 |
| 10 | ZOO 510 | Agricultural Entomology | 2 |
| 11 | ZOO 511 | Entomology LAB - I | 2 |

 9/9/2020
 05/09/2020
 9/9/2020
 09/09/2020
 Page 3 of 7


 09/09/2020

 9.9.2020
 09.09.2020

| Fish and Fisheries | | | |
|--------------------|---------|---------------------------------------|---|
| 12 | ZOO 512 | Fish Physiology | 2 |
| 13 | ZOO 513 | Fish Taxonomy and Fisheries | 2 |
| 14 | ZOO 514 | Limnology of Lakes, Streams and Ponds | 2 |
| 15 | ZOO 515 | Fisheries and Limnology LAB - I | 2 |
| Molecular Biology | | | |
| 16 | ZOO 516 | Advances in Molecular Biology | 2 |
| 17 | ZOO 517 | Genomics and Proteomics | 2 |
| 18 | ZOO 518 | Genetic Disorders and Cancer | 2 |
| 19 | ZOO 519 | Molecular Biology LAB - I | 2 |

Semester – 4

| Sr. No. | Course Code | Course Name | Credits |
|--------------------------------------|-------------|---------------------------------|---------|
| Core Compulsory (12 credits) | | | |
| 1 | ZOO 551 | Animal Physiology | 4 |
| 2 | ZOO 552 | Developmental Biology | 4 |
| 3 | ZOO 599 | M.Sc. Dissertation | 4 |
| Core Open/Elective Open (04 credits) | | | |
| 4 | ZOO 553 | Parasitology | 2 |
| 5 | ZOO 554 | Applied Zoology | 2 |
| 6 | ZOO 555 | Medical Microbiology | 2 |
| 7 | ZOO 556 | Endocrinology | 2 |
| Elective Specialization (04 credits) | | | |
| Entomology | | | |
| 8 | ZOO 557 | Medical Entomology | 2 |
| 9 | ZOO 558 | Entomology Lab-II | 2 |
| Fish and Fisheries | | | |
| 10 | ZOO 559 | Fish Diseases and Control | 2 |
| 11 | ZOO 560 | Fisheries and Limnology LAB- II | 2 |
| Molecular Biology | | | |
| 12 | ZOO 561 | Molecular Genetics | 2 |
| 13 | ZOO 562 | Molecular Genetics LAB - I | 2 |

Decision:

All members agreed and approved the list of above new courses with above minor modifications and need based reshuffling.

[Signature]
9/9/2020

[Signature]
09/09/2020

[Signature]
09/09/2020

[Signature]
09/09/2020

[Signature]
9.09.2020

[Signature]
09.09.2020

AGENDA ITEM NO. – ANS-BOS-2/20-3

Proposal for framing New Courses for Ph.D. programme in the Department of Animal Sciences in the CBCS format (for 2020 Batch onwards) as given in Annexure III.

Decision:

All members agreed and approved the list of new courses with minor modifications.

AGENDA ITEM NO. – ANS-BOS-2/20-4

Proposal of the Faculty Members of the Department of Animal Sciences to become M.Phil./Ph.D. Supervisor/Guide.

Decision:

The members unanimously resolved that since all Faculty Members possess requisite qualifications and desired experience to guide research students for M.Phil. and Ph.D. Degrees, hence they are approved as Supervisor(s)/Guide(s) for M.Phil./Ph.D scholars as per UGC guidelines.

1. Dr. Sunil Kumar, Associate Professor, Department of Animal Sciences, School of Life Sciences.
2. Dr. Rakesh Kumar, Assistant Professor, Department of Animal Sciences, School of Life Sciences.
3. Dr. Tarkeshwar, Assistant Professor, Department of Animal Sciences, School of Life Sciences.
4. Dr. Ranjit Kumar, Assistant Professor, Department of Animal Sciences, School of Life Sciences.

AGENDA ITEM NO. – ANS-BOS-2/20-5

Proposal of the allotment of Supervisor/Guide for the newly admitted Ph.D. Scholars (2020 batch).

Decision:

All members unanimously resolved to approve the following faculty members as Supervisor(s)/ Guide(s) for the newly admitted Ph.D. Scholars (2020 batch).

| Sr. No. | University Roll No. | Name | Father Name | Supervisor Name |
|---------|---------------------|------------------|--------------------|-------------------------|
| 1 | CUHP20RDANS01 | Bhavna | Purshottam Chand | Dr. Rakesh Kumar |
| 2 | CUHP20RDANS02 | Disha Chauhan | Rakesh Chauhan | Dr. Ranjit Kumar |
| 3 | CUHP20RDANS03 | Geetika | Ashwani Choudhary | Dr. Ranjit Kumar |
| 4 | CUHP20RDANS04 | Jigmet Yangchan | Tsering Motup | Dr. Sunil Kumar |
| 5 | CUHP20RDANS05 | Kanika Choudhary | Subhash Chand | Dr. Tarkeshwar |
| 6 | CUHP20RDANS06 | Kumari Ruchika | Wilson P. Dass | Dr. Tarkeshwar |
| 7 | CUHP20RDANS07 | Kushal Thakur | Pawan Kumar Thakur | Dr. Rakesh Kumar |

[Handwritten signatures and dates at the bottom of the page, including "9/9/2020", "09/09/2020", and "Page 5 of 7"]

AGENDA ITEM NO. – ANS-BOS-2/20-6

Proposal for the allotment of Dissertation students in 2nd or 3rd semester (M.Sc. Zoology).

Decision:

All Members agreed and approved the allotment of Dissertation students in 3rd semester (M.Sc. Zoology)

AGENDA ITEM NO. – ANS-BOS-2/20-7

Proposal of List of Experts as Examiners for the Practical and Viva Voce Examinations of M.Sc. Zoology as given in Annexure IV.

In accordance with the draft ordinance 4(i), Section 23 and Statute 16(2) of the Central Universities Act 2009, section 4(b) i and ii, the Head, Department of Animal Sciences placed before the members of the Board of Studies (BoS) the list of examiners for M.Sc. Practicals and Viva Voce Examination for their approval, as per list attached at Annexure IV.

Decision:

All members agreed and approved the list of examiners as proposed at Annexure IV. It was also suggested that the list will be updated regularly by the faculty members of the Department of Animal Sciences (DoAS) with the consent of the HoD, Animal Sciences and the same be reported in the next meeting of BoS. It was also suggested that preferably the subject/ course experts be invited for specific courses. The BoS also recommended that, if needed, HoD, Animal Sciences may invite a Subject Expert (External Examiner) not included in the list on the recommendations of the concerned faculty member(s) and after approval of Competent Authority of the University.

AGENDA ITEM NO. – ANS-BOS-2/20-8

To approve Dr. Sunil Kumar, Associate Professor, Department of Animal Sciences, SoLS, as Co-supervisor in the PhD thesis of Ms. Kanika Mahajan, Research Scholar, Department of Environmental Sciences. SoEES, CUHP, Dharamshala

Decision:

All members agreed and approved this agenda item.


AGENDA ITEM NO. – ANS-BOS-2/20-9

To approve Dr. Sunil Kumar, Associate Professor, Department of Animal Sciences, SoLS, as Co-supervisor in the PhD thesis of Ms. Diksha Pathania, Research Scholar, Ph.D. Botany (2017-18), Shoolni Univesity, Solan.

Decision:

All members agreed and approved this agenda item.

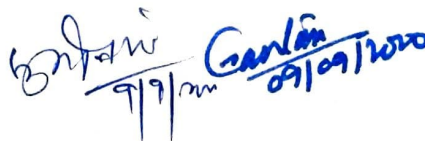

09/09/2020


09/09/2020


09/09/2020


09.09.2020


09.09.20


09/09/2020

AGENDA ITEM NO. – ANS-BOS-2/20-10

To Approve Dr. Rakesh Kumar, Assistant Professor, Department of Animal Sciences, SoLS, as Co-Supervisor in the PhD thesis of Mr. Bhagat Singh, Research Scholar, Department of Biotechnology, Delhi Technological University, Shahbad, Daulatpur, Delhi.

Decision:

All members agreed and approved this agenda item.

AGENDA ITEM NO. – ANS-BOS-2/20-11

Approval of New Courses in the Department of Animal Sciences, School of Life Sciences under B.Voc. (Bachelor of Vocational) category:-

1. Diploma in Medical Laboratory Technology.
2. Certificate Course in Insect Pest Management.
3. Certificate Course in Skill Development (Organic Farming, Apiculture, Sericulture and Aquaculture).

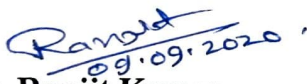
Decision:

All members agreed and approved the above mentioned new courses after the applying in University Grants Commission (UGC).

AGENDA ITEM NO. – CBB-BOS-5/18-8

Any item with the permission of the Chair: **No item was taken**

The meeting ended with a vote of thanks to the chair.


09.09.2020

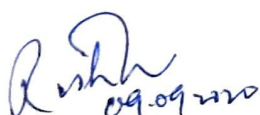
**Dr. Ranjit Kumar,
(Special Invitee)**


09/09/2020

**Dr. Tarkeshwar,
(Special Invitee)**


09/09/2020

**Dr. Rakesh Kumar
(Member)**


09.09.2020

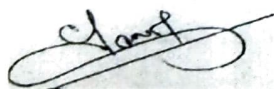
**Dr. Rishi Thakur
(Dean's Nominee)**


09/09/2020

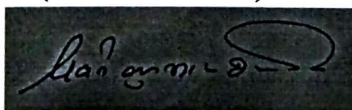
**Dr. Vikram Singh
(VC's Nominee)**


09/09/2020

**Dr. Mahesh Kulharia
(VC's Nominee)**



**Dr. Yogesh Kumar Rawal
(Subject Expert)**

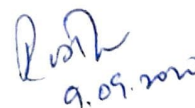


**Dr. Pawan Sharma
(Subject Expert)**


09/09/2020

**Dr. Sunil Kumar
Chairman & Convener**




9.09.2020


09.09.2020



हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

Central University of Himachal Pradesh

(Established under Central Universities Act 2009)

अस्थाई शैक्षणिक खण्ड, शाहपुर, जिला काँगड़ा, हिमाचल प्रदेश - 176206

Temporary Academic Block, Shahpur, Distt. Kangra (HP) - 176206

Website: www.cuhimachal.ac.in

फाइल संख्या: जीव विज्ञान/-1-5/पाठ्य समिति/हि.प्र.के.वि/18/40(A)

दिनांक: 10.05.2018

MINUTES OF THE FIRST BOARD OF STUDIES MEETING HELD ON

10TH May, 2018

The meeting of the First Board of Studies of the Department of Zoology, School of Life Sciences was held on 10th May, 2018 in the Committee Room of Central University of Himachal Pradesh, Temporary Academic Block, Shahpur. Prof. Ambrish Kumar Mahajan, Head, Department of Zoology, and, Dean, School of Life Sciences welcome all the Hon'ble members and presided over the meeting.

Following members attended the meeting:

- Prof. Ambrish Kumar Mahajan – Head and Convener**
Head, Department of Zoology and Dean, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
- Prof. Nripendranath Mandal – Subject Expert**
Division of Molecular Medicine, Bose Institute, Kolkata.
- Prof. Desh Raj Thakur – Subject Expert**
Department of Bio-Sciences, Himachal Pradesh University, Summer Hill, Shimla.
- Dr. Vikram Singh – Vice Chancellor's Nominee**
Centre for Computational Biology and Bioinformatics, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
- Dr. Polamarasetty Aparoy – Vice Chancellor's Nominee**
Centre for Computational Biology and Bioinformatics, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Shahpur.
- Ms. Nivedita Rana – Resource Person (Special Invitee)**
Department of Zoology, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Dehra.
- Dr. Vivek Sharma – Resource Person (Special Invitee)**
Department of Zoology, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Dehra.
- Dr. Rakesh Chauhan – Resource Person (Special Invitee)**
Department of Zoology, School of Life Sciences, Central University of Himachal Pradesh, Temporary Academic Block, Dehra.

Following Decision were taken in BOS meeting as per the Agenda.

Item ZOO-BOS-1/18-1: Approval of Rules of Business for the Board of Studies.

It was unanimously resolved that the draft rules of Business for the Board of Studies presented before the Board of Studies approval as "Rules of Business for the Board of Studies" which would come into effect from this day i.e. Thursday the 10th May, 2018. (Annexure-I)

Ambrish Kumar Mahajan
10/05/2018

Rakesh Chauhan
09/05/2018

Ambrish Kumar Mahajan
10/05/2018

Rakesh Chauhan
09/05/2018

Item ZOO-BOS-1/18-2: Approval of Courses for PG and RD Program {As per the Ordinance 4 clause 4 b(i)}.

The BOS approved the minutes of the **Curriculum Development Committee (CDC), Zoology** held on **28.08.2017 (Placed as ANNEXURE-A)** with following minor amendment(s) for the ongoing batch.

1. Some of the Courses from Course Compulsory and Course Open have been interchanged from the CDC.
2. The Course name of 3rd and 4th semester have been re-aligned from the courses approved in CDC and added new courses for the ongoing session as per Annexure-II.
3. The Practical/Lab courses have also been added in the 3rd and 4th semester as per CBCS guidelines.
4. M.Sc. Dissertation has been added for the ongoing session as per Annexure-II.
5. The Curricular Framework has been prepared as per Annexure – II for the forthcoming session.
6. The course contents to be prepared by the faculty members and will be placed in next BOS meeting for approval

Item ZOO-BOS-1/18-3: Approval of Supervisors for Research Program

BOS members recommend taking up this agenda once the Department will have research scholar.

Item ZOO-BOS-1/18-4: Approval of Examiners for conducting Practical Examination in End Term. [As per Ordinance 4 clause b(i)]. (Annexure- V)

Head Department of Zoology in consultation with the concern faculty members may add any other name to this list depending upon the situation as per need.

Item ZOO-BOS-1/18-5: Approval of Student's Industrial Training / Education Tours

It was unanimously resolved that students may go for Industrial/Research Training in different Research/Academic Institutes like FRI, FSI, ZSI, Wild Life Institute of India etc. and Educational Tours during summer/ winter vacations.

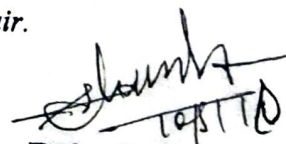
Item ZOO-BOS-1/18-6: Invited Talks/Lectures

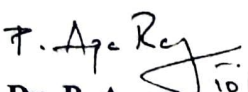
Unanimously resolved that Scientists, Professors and Eminent Scholars in the field of Zoology should be invited for delivering talks for the benefit of M.Sc. students.


The meeting ended with a vote of thanks to the Chair.


Ms. Nivedita Rana,
(Special Invitee)

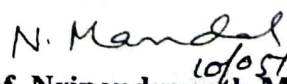

Dr. Vivek Sharma,
(Special Invitee)


Dr. Rakesh Chauhan
(Special Invitee)



Dr. P. Aparajit
(VC's Nominee)


Dr. Vikram Singh
(VC's Nominee)



Prof. Desh Raj Thakur
(Subject Expert)


Prof. Nripendranath Mandal
(Subject Expert)


Prof. Ambrish Kumar Mahajan
Chairman & Convener


9/9/2018


9/9/2018


09/09/2018


09/09/2018



09.09.2018

Table - 1: Revised Curricular Framework for M.Sc. in Zoology based on Choice Based Credit System (CBCS) (Year 2018)

| Semester | Total Credits | Core-Compulsory | Credits | Total Credits | Core-Open | Credits |
|-----------------|---------------|---|---------|---------------|--|---------|
| 1 st | 16 | ZOOL 410: Animal Taxonomy | 4 | | | |
| | | ZOOL 411: Ecology and Environment | 2 | | | |
| | | ZOOL 412: Cellular and Molecular Biology | 4 | | | |
| | | ZOOL 413: Invertebrate Biology | 2 | | | |
| | | ZOOL 414: Zoology Lab I | 2 | | | |
| | | ZOOL 415: Zoology Lab II | 2 | | | |
| 2 nd | 12 | ZOOL 416: Cytogenetics and Evolution | 2 | 4 | ZOOL 424: Biostatistics | 2 |
| | | ZOOL 417: Principles of Biochemistry | 2 | | ZOOL 425: Bioinformatics | 2 |
| | | ZOOL 418: Functional Anatomy of Chordates | 4 | | | |
| | | ZOOL 419: Zoology Lab III | 2 | | | |
| | | ZOOL 420: Zoology Lab IV | 2 | | | |
| 3 rd | 4 | ZOOL 525A: Entomology | 2 | 4 | ZOOL 527: Immunology and Biotechnology | 2 |
| | | ZOOL 526A: Animal Behaviour | 2 | | ZOOL 528: Ichthyology | 2 |
| 4 th | 8 | ZOOL 508: Animal Physiology | 4 | 4 | ZOOL 529: Parasitology | 2 |
| | | ZOOL 510: Developmental Biology | 4 | | ZOOL 530: Applied Zoology | 2 |

Gulam 9/9/2018
 Rakesh 09/09/2018
 9/9/2018
 10/05/18
 09.09.20
 Page 1 of 2
 09.09.20
 10/05/18
 N. Mandel 10/05/2018
 09/09/2018
 10/05/18
 10/05/18
 10/05/18
 10/05/18

| Semester | Total Credits | Elective-Open | | | | | | | | | |
|-----------------|---------------|---|--|---------|---|-----------------|----------------------------|-------------------------------|--|--|---|
| 3 rd | 4 | CBB 518: Elements of Systems Biology | | 4 | <p><i>Approved</i> <i>N. Mandel</i> <i>10/05/18</i></p> <p><i>P. Ag. R. J.</i> <i>10/05/18</i></p> | | | | | | |
| | | CBB 515: CADD <i>Computer aided drug discovery</i> | | 4 | | | | | | | |
| | | CBB 504: Genomics and Proteomics | | 4 | | | | | | | |
| Semester | Total Credits | Electives (Specialization) | | Credits | Semester | Total Credits | Electives (Specialization) | | Credits | | |
| 3 rd | 8 | Entomology | ZOO 571 A: Pesticides Hazards and Environment | | 2 | 4 th | 8 | Entomology | ZOO 574 (A): Medical Entomology | | 2 |
| | | | ZOO 572 A: Insect Control and IPM | | 2 | | | | ZOO 576: Entomology Lab - II | | 2 |
| | | | ZOO 573 A: Agricultural Entomology | | 2 | | | | ZOO 565: Fish Diseases and Control | | 2 |
| | | | ZOO 575: Entomology Lab - I | | 2 | | | | | | |
| | | Fish, Fisheries and Limnology | ZOO 561 A: Fish Taxonomy and Physiology | | 2 | | | Fish, Fisheries and Limnology | ZOO 567 : Fisheries and Limnology Lab - II | | 2 |
| | | | ZOO 562 A: Fish and Fisheries of India | | 2 | | | | ZOO 599: M.Sc. Dissertation | | 4 |
| | | | ZOO 563: Limnology of Lakes, Streams and Ponds | | 2 | | | | | | |
| | | | ZOO 566: Fisheries and Limnology Lab - I | | 2 | | | | | | |

g. l. hani
9/9/2020

Chandra
10/05/18

10/05/18

T. Ape Raj
10/05/18

9/9/2020

Page 2 of 2
09.09.2020

09.09.2020

N. Mandel
10/05/2018

10/05/18

09/09/2020

Pre Ph.D. Course in Animal Sciences (Zoology)

Scheme of Courses for Pre Ph.D. Course in Animal Sciences (Zoology)

| Course Code | C/E* | Course Name | Credits |
|-------------|------|--|---------|
| CPE-RPE | C | Research and Publication Ethics | 2 |
| ZOO - 601 | C | Basic Research Methodology | 4 |
| ZOO - 602 | E | Advanced Research Tools and Techniques | 4 |
| ZOO - 603 | E | Cell and Molecular Biology | 4 |
| ZOO - 604 | E | Advances in Entomology and Pest Management | 4 |
| ZOO - 605 | E | Advances in Fish and Fisheries | 4 |

*Students can select any two elective papers from above scheme.

C- Compulsory

E- Elective

The image shows several handwritten signatures and dates in blue ink. From left to right:

- A signature that appears to be 'Rashid' with the date '9/9/2020' below it.
- A signature that appears to be 'Rashid' with the date '09/09/2020' below it.
- A signature that appears to be 'Rashid' with the date '09/09/2020' below it.
- A signature that appears to be 'Rashid' with the date '09/09/2020' below it.
- A signature that appears to be 'Rashid' with the date '09/09/2020' below it.
- A signature that appears to be 'Rashid' with the date '09/09/2020' below it.

TABLE-I: Curricular Framework for M.Sc. Zoology based on Choice Based Credit System (CBCS) (Batch: 2020-21 onwards)

| Semester | Credits | Core - Compulsory | Credits | Credits | Core Open | Credits |
|----------|---------|--|---------|---------|--|---------|
| I | 14 | ZOO 401 - Cellular and Molecular Biology | 4 | 02 | ZOO 406 - Ecology and Environment | 2 |
| | | ZOO 402 - Invertebrate Biology | 2 | | ZOO 407 - Histology and Histochemistry | 2 |
| | | ZOO 403 - Animal Taxonomy | 4 | | ZOO 408 - Chronobiology | 2 |
| | | ZOO 404 - Cellular & Molecular Biology and Invertebrate Biology - LAB | 2 | | | |
| | | ZOO 405 - Animal Taxonomy and Histological Techniques - LAB | 2 | | | |
| II | 12 | ZOO 451 - Cytogenetics | 4 | 4 | ZOO 456 - Biostatistics and Bioinformatics | 2 |
| | | ZOO 452 - Principles of Biochemistry | 2 | | ZOO 457 - Fundamentals in Microbiology | 2 |
| | | ZOO 453 - Functional Anatomy of Chordates | 2 | | ZOO 458 - Evolution | 2 |
| | | ZOO 454 - Cytogenetics and Principles of Biochemistry - LAB | 2 | | ZOO 459 - Comparative Physiology | 2 |
| | | ZOO 455 - Functional Anatomy of Chordates and Fundamentals in Microbiology - LAB | 2 | | | |
| Semester | Credits | Core - Compulsory | Credits | Credits | Elective Open | Credits |
| III | 8 | ZOO 501 - Entomology | 2 | 4 | ZOO 504 - Animal Behavior | 2 |
| | | ZOO 502 - Immunology | 4 | | ZOO 505 - Animal Biodiversity | 2 |
| | | ZOO 503 - Ichthyology | 2 | | ZOO 506 - Animal Biotechnology | 2 |
| | | | | | ZOO 507 - Medical Biochemistry and Health | 2 |
| IV | 12 | ZOO 551 - Animal Physiology | 4 | 4 | ZOO 553 - Parasitology | 2 |
| | | ZOO 552 - Developmental Biology | 4 | | ZOO 554 - Applied Zoology | 2 |
| | | ZOO 599 - M.Sc. Dissertation | 4 | | ZOO 555 - Medical Microbiology | 2 |
| | | | | | ZOO 556 - Endocrinology | 2 |

| Semester | Credits | Elective (Specialization) Entomology | Credits | Semester | Credits | Elective (Specialization) Entomology | Credits |
|----------|---------|--|---------|----------|---------|---|---------|
| III | 8 | ZOO 508 - Pesticides Hazards and Environment | 2 | IV | 4 | ZOO 557 - Medical Entomology | 2 |
| | | ZOO 509 – Advances in Entomology and Pest Management | 2 | | | ZOO 558 - Entomology LAB - II | 2 |
| | | ZOO 510 - Agricultural Entomology | 2 | | | | |
| | | ZOO 511 - Entomology LAB - I | 2 | | | | |
| Semester | Credits | Elective (Specialization) Fish and Fisheries | Credits | Semester | Credits | Elective (Specialization) Fish and Fisheries | Credits |
| III | 8 | ZOO 512 - Fish Physiology | 2 | IV | 4 | ZOO 559 - Fish Diseases and Control | 2 |
| | | ZOO 513 - Fish Taxonomy and Fisheries | 2 | | | ZOO 560 - Fisheries and Limnology Lab - II | 2 |
| | | ZOO 514 - Limnology of Lakes, Streams and Ponds | 2 | | | | |
| | | ZOO 515 - Fisheries and Limnology LAB - I | 2 | | | | |
| Semester | Credits | Elective (Specialization) Molecular Biology | Credits | Semester | Credits | Elective (Specialization) Molecular Biology | Credits |
| III | 8 | ZOO 516 - Advances in Molecular Biology | 2 | IV | 4 | ZOO 561 - Molecular Genetics | 2 |
| | | ZOO 517 - Genomics and Proteomics | 2 | | | ZOO 562 - Molecular Genetics LAB - I | 2 |
| | | ZOO 518 - Genetic Disorders and Cancer | 2 | | | | |
| | | ZOO 519 - Molecular Biology LAB - I | 2 | | | | |

[Signature]
09/09/2020

[Signature]
09/09/2020

[Signature]
09/09/2020

[Signature]
9/9/2020

[Signature]
09/09/2020

[Signature]
09.09.2020

Human Making and Skill Development Courses to be offered by the Department of Animal Sciences:-

SEMESTER-I

| Human Making Courses (Total Credits =02) | | | |
|---|---------|--------------------------------|---|
| 1 | ZOO 409 | Sericulture and Apiculture | 2 |
| Skill Development Courses (Total Credits = 02) | | | |
| 1 | ZOO 410 | Advanced Techniques in Biology | 2 |

SEMESTER-II

| Human Making Course (Total Credits = 02) | | | |
|--|---------|---------------------------|---|
| 1. | ZOO 460 | Aquaculture | 2 |
| Skill Development Course (Total Credits = 02) | | | |
| 1. | ZOO 461 | Fundamentals of Wild Life | 2 |

Handwritten signature and date: 9/9/2020

Handwritten signature

09/09/20

Handwritten signature and date: 09/09/2020

Handwritten signature and date: 9/09/2020

Handwritten signature and date: 09.09.2020

Handwritten signature and date: 9/9/2020

Pre Ph.D. Course in Animal Sciences (Zoology)

Scheme of Courses for Pre Ph.D. Course in Animal Sciences (Zoology)

| Course Code | C/E* | Course Name | Credits |
|-------------|------|--|---------|
| CPE-RPE | C | Research and Publication Ethics | 2 |
| ZOO - 601 | C | Basic Research Methodology | 4 |
| ZOO - 602 | E | Advanced Research Tools and Techniques | 4 |
| ZOO - 603 | E | Cell and Molecular Biology | 4 |
| ZOO - 604 | E | Advances in Entomology and Management of Insect Pest | 4 |
| ZOO - 605 | E | Advances in Fish and Fishery | 4 |

*Students can select any two elective papers from above scheme.

C- Compulsory

E-Elective

alhami
9/9/2020

Ramji
09/09/2020

Ramji
9.9.2020

Ramji
09.09.2020

Rakesh
09/09/20

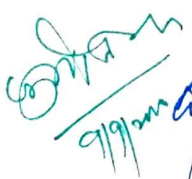
Gautam
09/09/2020

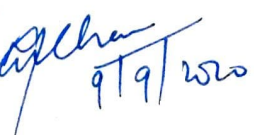
Ramji
9/9/2020

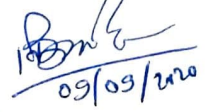
Page - 1

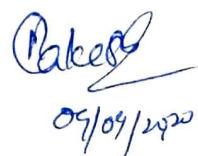
Detailed List of Experts/Examiners

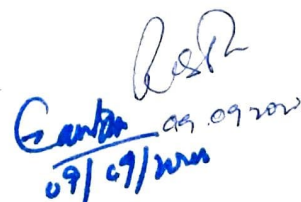
1. **Dr Pawan Kumar Sharam**, Principal Scientist, Department of entomology, CSKHPKV, Palampur, H.P., Mobile No: 9418031290, Email: pksgarg@rediffmail.com.
2. **Dr Virendra Kumar Rana**, Professor & Head, Department of Entomology, Horticulture and Forestry college, NERI, Hamirpur, Mobile: 9418602633, Email: vk_renu_uhf@yahoo.co.in.
3. **Prof. Sujeet Kumar**, Department of entomology, CSKHPKV, Palampur, H.P Mob: 9418153087 email: skumarhpau@gmail.com.
4. **Prof. K.S. Verma**, Department of entomology, CSKHPKV, Palampur, H.P. ksvermahpau@rediffmail.com.
5. **Dr. Meena Thakur**, Department of entomology, Dr. Y.S Parmar University of Horticulture and Forestry, Mobile: 9805294626, Email: thakurmn15@gmail.com.
6. **Prof. Deshraj Thakur**, Deptt. of Biosciences, HPU Shimla, Mob. 9418480248, Email: drdr4@gmail.com.
7. **Dr. Madhu Sharma** Deptt. of Biosciences , CSKHPKV Palampur, Mob: 9646684187 Email: madhu.srma@gmail.com.
8. **Prof. H.S. Banyal**, Vice Chancellor, Abhilashi University, Mandi Mobile:9418026223 Email: hsbanyal@yahoo.co.in.
9. **Dr. Y.K. Rawal**, Deptt. Of Zoology, Panjab University Chandigarh, mob: 986096196 Email: ykrawal@pu.ac.in.
10. **Dr. Mohinder**, Principal Scientist, Deptt. of Environment and Ecology, CSKHPKV Palampur, Mob: 9805865019 Email: mohinder62@rediffmail.com.
11. **Dr.(Mrs) Anju S. Khanna**, (Retired Professor) Farm Scientist Colony, Shamti, Solan HP anjusk20@yahoo.co.in Mobile 9218585036
12. **Dr. K.C. Sharma**, (Retired Professor) H.No. 195/8 Mohan Colony Solan - 173212 krishan_chander@yahoo.in
13. **Dr. Pankaj Sood**, Principal Scientist, KVK Mandi at Sundernagar-175019, Mandi-Himachal Pradesh. pankajplp@rediffmail.com
14. **Dr. Prem Chand Sharma**, (Senior Scientist) CSK Himachal Pradesh Agriculture University, Palampur premento@rediffmail.com
15. **Dr. Y S Chandel**, (Retired Professor) Village Matehar, PO Banuri, Palampur (HP)-176061 chandel_hpau@rediffmail.com
16. **Dr. K.S. Verma**, (Professor) Dept of Entomology, CSKHPKV Palampur HP-176062 ksvermahpau@rediffmail.com
17. **Dr Yogita Thakur**, Associate Professor, Eternal University, Baru Sahib Dist Sirmour HP-173101 thakuryogita@gmail.com 9418061815
18. **Dr Vandana Kumari**, Dept. of Zoology, MSMDAV College, College Road, Kangra HP-176001 vandanakangoo@gmail.com 7018320977
19. **Dr Anupam Sharma**, Dept. of Zoology, MSMDAV College, College Road, Kangra HP-176001 anupam_ihbt@hotmail.com 9817600794
20. **Dr Ajay Sharma**, Dept of Entomology, Dr Y S Parmar University of Horticulture & Forestry, Nauni, Solan HP-173230 ajaydivyam@rediffmail.com 9418081019

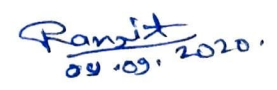

9/9/2020


9/9/2020


09/09/2020


09/09/2020


09/09/2020


09.09.2020

21. **Dr V K Rana**, Professor & Head, Dept of Entomology, COHF, Neri, Hamirpur HP-177001
vk_renu_uhf@yahoo.co.in Mobile: 8219850487
22. **Dr. Shvetambri Jasrotia**, Assistant professor, Department of Zoology, Central University of Jammu, Bagla (Rahya - Suchani), Samba - 181143, Jammu (J&K.), e-mail: j.shvetambri@yahoo.com
23. **Professor R. Jindal**, Deptt. of Zoology, Panjab University Chandigarh, Phone no. 9815650987 Email rjindal@pu.ac.in
24. **Prof. M. S. Johal (Head)**, Deptt. of Zoology, Akal university Talbindi sahbo, Bathinda Punjab, Mob. 9815827390. Email johal_ms@yahoo.com
25. **Dr. Ram Krishan Negi**, Associate Prof., Department of Zoology, University of Delhi, Delhi-110007, Email: negi_gkv@rediffmail.com phone no. 8800209901.
26. **Dr. Onkar Singh Brraich**, Department of Zoology and Environmental Sciences, Punjabi University, Patiala -147002, Punjab, India – 147002, Phone no. 081465-83347, Email: onkarpscst@gmail.com
27. **Professor Sukhbir Kaur**, Deptt. of Zoology, Panjab University Chandigarh, Mobile. 9988173267, Email: sukhbir@pu.ac.in
28. **Prof. Ashok Kumar Ghosh**, Chairman, Bihar State Pollution Control Board, Patna & Head of Department, Research Centre, Mahavir Cancer Institute and Research Centre, Phulwarisharif, Patna (Bihar), Mobile: 9934304251, Email: ashok.ghosh51@gmail.com
29. **Dr Sushil Kumar**, Head, Department of Environment and Water Management. A.N. College, Patliputra University, Patna (Bihar), Mobile: 9973198841
30. **Prof. Shatrunjay Kumar Singh**, Former Head, Department of Environment and Water Management, A.N. College, Patliputra University, Patna (Bihar), Mobile No: 9661990018, Email: shatrunjay54@gmail.com
31. **Dr. Amitava Dey**, Principal Scientist & Head Division of Livestock and Fisheries Management, ICAR, Patna, Mob: 943188179 Email: amitavdey@yahoo.co.in
32. **Dr. Rizwanul Haque**, Head , Department of Biotechnology, Central University of South Bihar, Bodh Gaya, Mobile No: 8581800619, Email: rhaque@cub.ac.in
33. **Dr. Kapinder Kumar**, Assistant Professor, Department of Zoology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh, Ph. No.- 6394359577, 8750135330, Email: kapinder.zool@ddugu.ac.in
34. **Dr. Swati Diwakar**, Assistant Professor, Department of Environmental Studies, University of Delhi, Delhi, Ph. No. 9899407900, Email: sdiwakar@eb.du.ac.in
35. **Dr. Anjana Singha Naorem**, Assistant Professor, Department of Zoology, Cotton University, Guwahati, Assam, Ph. No. 9910720094, Email: anjanasingha@gmail.com
36. **Dr. Hemant Ritturaj Kushwaha**, Assistant Professor, School of Biotechnology, Jawaharlal Nehru University, Delhi, Ph. No. 9868801604, 8076369267, Email: hemantkushwaha@jnu.ac.in , ritturajhemant@gmail.com
37. **Dr. Indrakant Kumar Singh**, Assistant Professor, Department of Zoology, Deshbandhu College, University of Delhi, Delhi, Ph. No. 9310071333, Email: iksingh@db.du.ac.in
38. **Dr. Varsha Singh**, Assistant Professor, Department of Zoology, Kalindi College, University of Delhi, Delhi, Ph. No. 8920660077, Email: varshabhu@gmail.com

Alkhanda
9/9/2020

Ramjit
29/09/2020

Rakesh
09/09/2020

Rishi
9.09.2020

Ganton
09/09/2020