CURRICULUM PLANNING AND IMPLEMENTATION

Course Name: Biology for Chemists

Programme : M.Sc. Chemistry
Semester: II
Name of the Teacher: Prof. Surbjit Singh
Availability Timings: 9:00 AM to 4:30 PM
E-mail: surbjitzoologylkc@gmail.com

Objectives of the Course:

The course aims to:

1. Understand Chemistry of biomolecules and their significance.
2. Understand tissue organization.
3. Understand the principle of heredity.
4. Understand the viruses and their structure.

Course Content:

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: one per week
- Assignments : The students will be asked to read the textbooks related to the subject and topics and class tests will be conducted in the classes after the completion of each unit
- PowerPoint Presentations
- Quiz

Program Learning Outcomes:

a) **Knowledge and Understanding**: Apply a basic core of scientific and quantitative knowledge.

b) **Intellectual Cognitive /Analytical skills**: To enhance understanding of biologically important molecules, Tissues organization and basic principle of heredity.

c) **Practical skills**: Develop and maintain a notebook of laboratory records.

d) **Transferable skills**: Utilize laboratory skills to enhance understanding of biologically important molecules, animal and plant tissues.

Modes of Assessment	**Minimum Score Required (to Qualify for the Next Exam/Class)**	**Schedule**
Continuous Internal Evaluation(CIE) 1.Class Tests (Unit wise) 2.Student Seminars 3. In House Exams		
	40%	**After Each Unit**
		Every week
	35%	**Last Week of March**
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	**Teaching Dates**
I	**11 January to 28 January**
II	**31 January to 22 February**
III	**26 February to 24 March**
IV	**26 March to 15 April**

Revision	**Till Ist week of May**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

1. Cord Biology – South Western Educational Publications, Texas, 2000.

E- resources

https://www.pdfdrive.com/biological-inorganic-chemistry-a-new-introduction-to-molecular-structure-and-function-e190020594.html

https://www.pdfdrive.com/chemical-biology-enabling-approaches-for-understanding-biology-volume-10-chemical-and-biological-synthesis-e187905096.html

CURRICULUM PLANNING AND IMPLEMENTATION

Paper: BT-1: Zoology-B

Programme : B.Sc. (Biotechnology)

Semester: II

Name of the Teacher: Prof. Gurjinder Kaur

Availability Timings: 9:00 AM to 4:30 PM

E-mail: gurjinderzoologylkc@gmail.com

Objectives of the Course:

As a sub-discipline of biology, the focus of physiology is on how organisms, organ systems, organs, cells, and biomolecules carry out the chemical and physical functions that exist in a living system. Animal physiology is the scientific study of the life-supporting properties, functions and processes of animals or their parts. The discipline covers key homeostatic processes, such as the regulation of temperature, blood flow and hormones.

Course Content:

Urinogenital System:Structure of kidney and nephron, strcuture of gonads and urinogenital ducts, Menstural cycle, Urine formation, osmoregulation.

Endocrine System:Structure and physiology of thyroid, parathyroid, adrenal, hypothalamus, pituitary, pancreas and gonads of mammals.

Nervous System: Anatomy of brain and cranial nerves of man, Nature, origin and propagation of impulse along the axon, synapse and myoneural junctions. Sense Organs.

Skeleton System: Red & White muscle fibre, striped, unstriped and cardiac muscle fibre in man. Ultrastructure, physiological and biochemical basis of skeletal muscle contraction.

Detailed Course Contents:Available atwww.gndu.ac.in.

What will be the teaching methods:

- Lectures : Three per week
- Student Seminars: One per week
- Assignments : The students will be asked to read the textbook and reference books and write articles on given topics
- PowerPoint Presentations
- Participatory and Experiential Learning

- Quiz

Program Learning Outcomes:

- Students will able to understand functioning of various systems as well as its applied aspects.

A. Knowledge and Understanding):

Students will

- Focus on organ systems in animalsand will learn how those organs work.

B. Intellectual(Cognitive/ Analytical) Skills:

Students will be able to

- Understand living organisms.

C. Practical Skills:

Students will learn:

- Practically about anatomy and behavior of animals and making notes and sketches in notebook of the things found.

D. Transferable Skills:

Students will be able to

- Teamwork
- Practical knowledge
- Effective communication skill to ensure accurate and appropriate information transfer.

Modes of Assessment	Minimum Score Required (to Qualify for the Next Exam/Class)	Schedule
Continuous Internal		

Evaluation(CIE) 1.Class Tests (Unit wise) 2.Student Seminars 3. In House Exams	**40%**	**After Each Unit**
		Every week
	35%	**Third week of March**
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	Teaching Dates
I	**11 January to 4 February**
II	**6 February to 28 February**
III	**4 March to 24 March**
IV	**26 March to 11 April**
Revision	**Till 30 April**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

Kaur, T., Sappal, G. S., Badhwar, R. K., Narula, S, Gupta, N. and Puri, P. A text Book of Biotechnology: Life Sciences – I. Lakhanpal Publishers.

References:

1. Guyton, A.S.(1994), Text Book of Medical Physiology, 7th Edition, W.B. Saunders Company.
2. Hill, R. W., Wyse, G. K. and Anderson, N. (2004), Animal physiology, Sinauer Associate, INC. Pub. Saunderland, Massachusettes, USA.
3. Hoar, W. S. (1984), General and Comparative Physiology, Prentice Hall of India Pvt. Limited, New Delhi, India.

4. Sobti, R.C. & Nigam, S.K. (2002). Structural & function biology of chordates, Vishal Publishers, Jalandhar.

5. Sobti, R.C. & Sharma, V.L. (2005). Basics of Biotechnology: Introduction of Life Sciences. Vishal Publishers, Jalandhar.

6. Sobti, R.C. (2005). Introduction to Biotechnology, Part-2, Concepts Tools and Application, Vishal Publishers.

E- resources

- http://www.freebookcentre.net/biology-books-download/Animal-Behavior-Wiki.html
- https://www.goodreads.com/book/show/4111020-animal-physiology
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1328089/pdf/janatphys00122-0141c.pdf
- https://archive.org/details/textbookofanimal00mill/page/n11

CURRICULUM PLANNING AND IMPLEMENTATION

Course Name: BT-6 Molecular Biology

Programme : B.Sc. Biotechnology
Semester: IV
Name of the Teacher: Dr. Gagandeep Kaur
Availability Timings: 9:00 AM to 4:30 PM
E-mail: gaganzoologylkc@gmail.com

Objectives of the Course:

This course provides knowledge about molecular biology and explains its functional role in our life. The student will be able to understand the DNA replication, chromosomes, DNA structure, recombination, molecular mechanisms and gene expression of different genes of prokaryotes and eukaryotes.

Course Content:

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Three per week
- Student Seminars: two/ three per month
- Assignments : The students will be asked to read the textbooks related to the subject and topics and class tests will be conducted in the classes after the completion of each unit
- Practicals related to subjects
- Powerpoint Presentations
- Quiz

Program Learning Outcomes:

Knowledge and understanding:

Students will understand the concept and methods of inheritance.

- Know the mechanism of transcription and translation.

- Understand the recombination and molecular mechanisms.
- Understand structure of prokaryotic and eukaryotic genes.

Intellectual skills: Students will

- Able to take useful lecture notes and to participate in classroom discussions.
- Able to understand the molecular basis of inheritance.

Practical skills:

- Demonstrate the gene expression of different genes.
- Able to explain the basic mechanisms of recombinations.

Transferable skills:

- Discuss their views and ideas, through different means (oral, written and visual)
- Use the information technology to gather information and right reports.

Modes of Assessment	**Minimum Score Required (to Qualify for the Next Exam/Class)**	**Schedule**
Continuous Internal Evaluation(CIE)		
1.Class Tests (Unit wise)	**40%**	**After Each Unit**
2.Student Seminars		**Every week**
3. In House Exams	**35%**	**Last Week of March**
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	Teaching Dates
I	11 January to 28 January
II	30 January to 20 February
III	24 February to 21 March
IV	24 March to 15 April
Revision	Till Ist week of May

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

1. Adams, R. L. P., Knowler, J. T., and Leader, D. P. (1992). The Biochemistry of Nucleic acids, 11th ed., Champman and Hall, The New York/London/Tokyo/Melbourne/Madras.

2. Bolsover, S. R., Hyams, J. S., S. Shephard, E. A. and White H. A. (1997) from Genes to Cells., John Wiley and Sons.

3. Lewin, B (1997), Gene VI, Oxford University Press. 10. Maulik, S. and Patel, S. D. (1997). Molecular Biotechnology Therapeutic Application and Strategies, John Wiley & Sons.

4. R. W. Old and S. B. Primrose (1989): Principles of Gene Manipulation : An Introduction to Genetic Engineering. Black Well Scientific Publications.

5. Strachan, T. A. and Read, A. P. (1996). Human Molecular Genetics, John Willey and sons.

E- resources

https://www.pdfdrive.com/molecular-cell-biology-molecular-cell-biology-e7302545.html

https://www.pdfdrive.com/molecular-cell-biology-lodish-e18764931.html

https://www.pdfdrive.com/principals-and-techiniques-of-biochemistry-and-molecular-biology-7th-e18725198.html

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CURRICULUM PLANNING AND IMPLEMENTATION

Course Name: ZOO – II A (Ecology)

Programme : B.Sc. Medical
Semester: II
Name of the Teacher: Prof. Surbjit Singh
Availability Timings: 9:00 AM to 4:30 PM
E-mail: surbjitzoologylkc@gmail.com

Objectives of the Course:

This course aims to understand the interactions of organisms and their environments and the consequences of these interactions for population, community, and ecosystem dynamics.

Course Content:

The course provides an introduction to ecology, its subdivisions and the scope of ecology. Under this course students are familiar with the term ecosystem and its components, major ecosystems of the world and ecological factors. This course also includes biogeochemical cycles, Ecological adaptations, Population and its regulation, Inter and intraspecific relationship, biotic communities, ecological succession, ecological niche. In this course students will also come across with Renewable and non renewable resources and their conservation. Human being is now facing a common hazard issue regarding environment. In this course students also gain knowledge about environmental issues; their cause, impact and control.

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: one per week

- Assignments : The students will be asked to read the textbooks related to the subject and topics and class tests will be conducted in the classes after the completion of each unit
- Powerpoint Presentations
- Practicals related to subjects
- Quiz

Program Learning Outcomes:

a) **Knowledge and Understanding**: Apply a basic core of scientific and quantitative knowledge

b) **Intellectual Cognitive /Analytical skills**: to enhance understanding of cell structure and function at the molecular level.

c) **Practical skills**: Develop and maintain a notebook of laboratory records.

d) **Transferable skills**: Utilize laboratory skills to enhance understanding of cell structure and function while participating in a group environment.

Modes of Assessment	**Minimum Score Required (to Qualify for the Next Exam/Class)**	**Schedule**
Continuous Internal Evaluation(CIE)		
1.Class Tests (Unit wise)	**40%**	**After Each Unit**
		Every week

2.Student Seminars 3. In House Exams	**35%**	**Last Week of March**
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	Teaching Dates
I	**11 January to 28 January**
II	**31 January to 22 February**
III	**26 February to 24 March**
IV	**26 March to 15 April**
Revision	**Till Ist week of May**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

1. Kreb C.J. (1982), Ecology, Harper & Row, New York.

2. Putmann, R. J. and Wratten, S. D. (1984), Principles of Ecology, Crown Helm, London.

References:

1. Anderwartha, H.G. and Birch, L. C. (1970), The distribution and abundance of animals, University of Chicago Press, Chicago London.

2. Beeby, A. (1992), Applying Ecology, Chapman and Hall Madras.

3. Begon, M., Harper J. L. and Townsend, C. R. (1995), Ecology – Individuals, populations and communities, Blackwell Science, Cambridge UK.

4. Brewer, R. (1994), The science of Ecology, Saunders College of Publishing, New York.

5. Chapman, J. L. and Resis, M. J. (1995), Ecology- Principles and applications, Cambridge University Press, Cambridge UK.

6. Kaeighs, S. C. (1974), Ecology with special references to animal and Man, Prentice Hall Inc.

7. Kormondy, E.J. (1975), Concept of Ecology, Englewood Cliffs, N.J. Prentice Hall Inc.

E- resources

- https://www.pdfdrive.com/wildlife-ecology-conservation-and-management-e34323429.html
- https://www.pdfdrive.com/the-ecology-book-e187951226.html
- https://www.pdfdrive.com/environment-ecology-and-exergy-enhanced-approaches-to-environmental-and-ecological-management-e181772263.html

CURRICULUM PLANNING AND IMPLEMENTATION

Paper: ZOO-II B: Biodiversity-II (Arthropoda to Hemichordata)

Programme: B.Sc. (Medical)
Semester: II
Name of the Teacher: Prof. Jaswinder Kaur
Availability Timings: 9:00 AM to 4:30 PM
E-mail: jaswinderkaurzoology@gmail.com

Objectives of the Course:

The course will cover Invertebrates, which is the science that studies the animals without backbone. Introduce students to the difference between invertebrates and vertebrates. Study the link between vertebrates and invertebrates. By the end of this course, students will have a good understanding of the role of invertebrates in ecosystem stability and functioning.

Course Content:

Study of live animals is the focus of this course. The course provides an introduction to the scientific study of the animals without backbone. All aspects of living invertebrates like will be studied. Complete anatomy, morphology, histology and physiology of invertebrates will be covered.

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: one per week
- Assignments : The students will be asked to read the textbook in advance and write articles on given topics
- PowerPoint Presentations
- Participatory and Experiential Learning
- Quiz

Program Learning Outcomes:

A. Knowledge and Understanding:

Students will

- Examine animals in depth, learning about their anatomy and behavior.
- Focus on organ systems in each animal they study and how those organs work.
- Gain some understanding of the diversity of invertebrate animals by making comparisons among the animals.

B. Intellectual (Cognitive/ Analytical) Skills:

Students will be able to

- Understand living organisms.
- Understand diversity of invertebrates/ non chordates.

C. Practical Skills:

Students will learn:

- Practically about anatomy and behavior of animals and making notes and sketches in notebook of the things examined.

D. Transferable Skills:

Students will be able to

- Work in a team
- Gain practical knowledge
- Effectively communicate to ensure accurate and appropriate information transfer.

Modes of Assessment	Minimum Score Required (to Qualify for the Next Exam/Class)	Schedule
Continuous Internal Evaluation(CIE)		
1.Class Tests (Unit wise)	**40%**	**After Each Unit**
2.Student Seminars		**Every week**
	35%	**Third week of March**

3. In House Exams		
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	Teaching Dates
I	**11 January to 3 February**
II	**6 February to 27 February**
III	**3 March to 23 March**
IV	**25 March to 10 April**
Revision	**Till 30 April**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

Dhami, P.S. & Dhami, J. K., Invertebrates, R. Chand & Co., New Delhi, 2001.

References:

1. Barnes, R.D. (1999), Invertebrate Zoology. W.B. Saunder, Philadelphia.
2. Barth, R. H. and Broshears, R. E (1982), The Invertebrate world. Holt Saunder, Japan.
3. Brusca, R. C. and Brusca, G. J. (2003), Invertebrates (2nd ed), Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.
4. Engemann, J. G. and Hegner, R. W. (1981), Invertebrate Zoology (3rd ed), Macmillan, New York.
5. Gardiner, M. S. (1972), The Biology of Invertebrates, McGraw Hill, New York.
6. Meglitsch, P. A. and Schran, F. R. (1991), Invertebrate Zoology (3rd ed), Oxford University Press, New York.
7. Pechenik, A. Jan. (2000), Biology of the invertebrates, (4th ed), McGraw Hill Book Co. Singapore.
8. Kotpal, R. L. (2009). Modern Text Book of Zoology: Invertebrates. Rastogi Publications, Meerut.

9. Parker, T. J. and Haswell, W. A. Text Book of Zoology: Invertebrates. [Marshall, A. J. and Williams, W. D.; Eds]. AITBS Publishers, New Delhi, India.
10. Verma, P. S. A Manual of Practical Zoology: Invertebrates. S. Chand & Company Pvt. Ltd., New Delhi.

E- resources

https://en.wikipedia.org/wiki/Invertebrate_zoology

https://www.saraspublication.com/books/a-text-book-of-invertebrates/

CURRICULUM PLANNING AND IMPLEMENTATION

Course Name: ZOO-IV A (Biochemistry)

Programme : B.Sc. Medical
Semester: IV
Name of the Teacher: Dr. Gagandeep Kaur
Availability Timings: 9:00 AM to 4:30 PM
E-mail: gaganzoologylkc@gmail.com

Objectives of the Course:

The course aims to:

1. Understand the Basics of Biochemistry and Chemistry of biomolecules and their significance.
2. Understand the Protein structure i.e. Primary, Secondary, Tertiary and Quaternary.
3. Understand the chemistry of hormones.
4. Understand the structure and properties of the enzymes as well as its activity.
5. Understand the process of Lipid, Proteins and Carbohydrate metabolism.

Course Content:

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: one per week
- Assignments : The students will be asked to read the textbooks related to the subject and topics and class tests will be conducted in the classes after the completion of each unit
- Practicals related to subjects
- Powerpoint Presentations

- Quiz

Program Learning Outcomes:

(Knowledge and Understanding, Intellectual Skills, practical Skills, Transferable skills)

a) Student should be able to demonstrate an understanding of fundamental biochemical principles, such as the structure/function of biomolecules, metabolic pathways, and the regulation of biological/biochemical processes.
b) Student gained proficiency in basic laboratory techniques in both chemistry and biology.

Modes of Assessment	**Minimum Score Required (to Qualify for the Next Exam/Class)**	**Schedule**
Continuous Internal Evaluation(CIE)		
1.Class Tests (Unit wise)	**40%**	**After Each Unit**
2.Student Seminars		**Every week**
3. In House Exams	**35%**	**Last Week of March**
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	**Teaching Dates**

I	**11 January to 28 January**
II	**30 January to 20 February**
III	**24 February to 21 March**
IV	**26 March to 15 April**
Revision	**Till Ist week of May**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

1. Conn, E.E., Stump. P.K. Bruening, S. and Doi R.H. (1987), Outlines of Biochemistry (5th ed), John Wiley and Sons Inc., New York.

2. Fischer, J. and Arriold, J.R.P. (2001). Instant notes in Chemistry for Biologists, Viva Books Pvt. Ltd.

3. Harper, H.A. (2000): Harper's Biochemistry (25th ed).

References:

1. Holde, K.E.V., Johnson, W.C. and Shing, P. (1998). Principles of Physical Biochemistry Prentice Hall, Inc., USA.

2. Lehninger, A (2000). Principles of Biochemistry, (3rd ed).

3. Morris, H. Best, L.R., Pattison, S., Arerna, S. (2001). Introduction to General Organic Biochemistry, (7th ed), Wadsworth Group.

4. Rawn, J.D. (1989), Biochemistry, Niel Patterson Publication U.S.A. North Carolina.

5. Robert, K., Murray, Mayes Daryl, K. Granner, Victor, W., Woodwell (1990), Harper's Biochemistry, 22nd Edition, Prentice Hall International Inc.

6. Sheehon, D (2000). Physical Biochemistry: Principles and Applications – John Wiley & Sons Ltd., England.

7. Stryer, L. (1988). Biochemistry (3rd ed), San Francisco W.H. Freeman

E- resources

https://www.pdfdrive.com/textbook-of-biochemistry-e14983388.html

https://www.pdfdrive.com/lehninger-principles-of-biochemistry-2004pdf-e58353509.html

https://www.pdfdrive.com/principals-and-techiniques-of-biochemistry-and-molecular-biology-7th-e18725198.html

CURRICULUM PLANNING AND IMPLEMENTATION

Paper: ZOO-IVB: Animal Physiology

Programme : B.Sc. (Medical)
Semester: IV
Name of the Teacher: Prof. Gurjinder Kaur
Availability Timings: 9:00 AM to 4:30 PM
E-mail: gurjinderzoologylkc@gmail.com

Objectives of the Course:

As a sub-discipline of biology, the focus of physiology is on how organisms, organ systems, organs, cells, and biomolecules carry out the chemical and physical functions that exist in a living system. Animal physiology is the scientific study of the life-supporting properties, functions and processes of animals or their parts. The discipline covers key homeostatic processes, such as the regulation of temperature, blood flow and hormones.

Course Content:

Digestive System
Respiratory System
Circulatory System
Excretory System
Muscular System
Nervous System
Endocrine System
Physiology of Behavoiur

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: One per week
- Assignments : The students will be asked to read the textbook and reference books and write articles on given topics

- PowerPoint Presentations
- Participatory and Experiential Learning
- Quiz

Program Learning Outcomes:

- Students will able to understand functioning of various systems as well as it's applied aspects

B. Knowledge and Understanding):

Students will

- Focus on organ systems in animalsand will learn how those organs work.

B. Intellectual(Cognitive/ Analytical) Skills:

Students will be able to

- Understand living organisms.

C. Practical Skills:

Students will learn:

- Practically about anatomy and behavior of animals and making notes and sketches in notebook of the things found.

D. Transferable Skills:

Students will be able to

- Work in a team
- Gain practical knowledge
- Effectively communicate to ensure accurate and appropriate information transfer.

Modes of Assessment	Minimum Score Required (to Qualify for the Next Exam/Class)	Schedule
Continuous Internal		

Evaluation(CIE) 1.Class Tests (Unit wise) 2.Student Seminars 3. In House Exams	**40%** **35%**	**After Each Unit** **Every week** **Third week of March**
End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	Teaching Dates
I	**11 January to 4 February**
II	**6 February to 28 February**
III	**4 March to 24 March**
IV	**26 March to 11 April**
Revision	**Till 30 April**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

Dhami, P.S. & Dhami, J. K. Animal Physiology, R. Chand & Co., New Delhi, 2001.

References:

1. Guyton, A.S.(1994), Text Book of Medical Physiology, 7th Edition, W.B. Saunders company.
2. Hill, R. W., Wyse, G. K. and Anderson, N. (2004), Animal physiology, Sinauer Associate, INC. Pub. Saunderland, Massachusettes, USA.
3. Hoar, W. S. (1984), General and Comparative Physiology, Prentice Hall of India Pvt. Limited, New Delhi, India.
4. Prosser, C.L. (1984), Comparative Animal Physiology, Satish Book Enterprise Bookseller & Publishers, Agra.
5. Purves, W. K., Oriane, G. H., Space, H. C. and Salava, D. (2001), Life – The Science of Biology (6th ed), Sinauer Assoc. Inc., USA.

6. Randall, D., Burggren, K.L. and French, K. (2002), Eckert Animal Physiology: Mechanisms and Adaptations, W.H. Freeman and Company, New York.
7. Taneja, S.K.(1997), Biochemistry & Animal Physiology, Trueman Book Co.
8. Willmer, P. Stone, G. and Johnston, I (2000). Environmental Physiology of Animals, Blackwell Science.
9. Withers, P.C. (1992), Comparative Animal Physiology, Saunder College Publishing, New York.

E- resources

- http://www.freebookcentre.net/biology-books-download/Animal-Behavior-Wiki.html
- https://www.goodreads.com/book/show/4111020-animal-physiology
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1328089/pdf/janatphys00122-0141c.pdf
- https://archive.org/details/textbookofanimal00mill/page/n11

CURRICULUM PLANNING AND IMPLEMENTATION

Course Name: ZOO-VI A: Option-I (Medical Zoology)

Programme : B.Sc. Medical
Semester: VI
Name of the Teacher: Prof. Surbjit Singh
Availability Timings: 9:00 AM to 4:30 PM
E-mail: surbjitzoologylkc@gmail.com

Objectives of the Course:

1. Brief introduction to pathogenic microbes, viruses, Ricketsiae, spirochaetes and bacteria.
2. Brief accounts of life history, mode of infection and pathogenicity of different protozoans and helminthes diseases to man; prophylaxis and treatment.
3. Life cycle and control measures of arthropod vectors of human disease.
4. Epidemic diseases, such as Typhoid, Cholera, Small pox; their occurrence and eradication programs.
5. Brief introduction to human defence mechanisms.
6. To study Antigen and antibody interactions and vaccines.

Course Content:

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: one per week
- Assignments : The students will be asked to read the textbooks related to the subject and topics and class tests will be conducted in the classes after the completion of each unit
- Powerpoint Presentations
- Practicals related to subjects

- Quiz

Program Learning Outcomes:

(Knowledge and Understanding, Intellectual Skills, practical Skills, Transferable skills)

Students are able:

1. To study and understand the scope and branches of Medical Zoology.
2. To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship.
3. To increase awareness for the health in students.
4. Understand the various disease causing vectors like Mosquitoes.
5. To aware about the typhoid, cholera like disease.
6. Understand the importance of medical diagnostic.
7. To learn about antigen antibody interactions.

Modes of Assessment	**Minimum Score Required (to Qualify for the Next Exam/Class)**	**Schedule**
Continuous Internal Evaluation(CIE)		
1.Class Tests (Unit wise)	**40%**	**After Each Unit**
2.Student Seminars		**Every week**
3. In House Exams	**35%**	**Last Week of March**

End of Semester Exam	**35%**	**Last week of April/ First week of May onwards**

Teaching Outline:

Unit	Teaching Dates
I	**11 January to 28 January**
II	**31 January to 22 February**
III	**26 February to 24 March**
IV	**26 March to 15 April**
Revision	**Till Ist week of May**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

1. Baker, F.J. and Silverton, R.E. (1985) Introduction to Medical Laboratory Technology, (6 th ed), Butlerworth and Co. Ltd.

2. Chatterjee, K.D.(1995), Parasitology, Protozoology and Helminthology (12th ed).

References:

1. Cheesborough, M.(1987), Medical Laboratory Technology for Tropical countries (2nd ed), Butlerworth and Co., Ltd.

2. Garcia, L.S.(2001), Diagnostic Medical Parasitology, (4th ed), ASM Press Washington.

3. Kimball, J.W. (1986), Introduction of Immunology, MacMillian Publishing Co., New York.

4. Kuby, J.(2000), Immunology, W.H. Freeman & Co., USA.

5. Roitt, I. (1984), Essential Immunology, Blackwell Scientific Publications, Oxford.

6. Talib, V.H. (1999), Essential Laboratory Manual, Mehta Publishers, New Delhi.

E- resources

- https://www.pdfdrive.com/department-of-zoology-bsc-imb-msc-zoology-mphil-zoology-msc-microbiology-e60540958.html
- https://www.pdfdrive.com/foundations-of-parasitology-8th-edition-e162142569.html

CURRICULUM PLANNING AND IMPLEMENTATION

Paper – ZOO-VI B: Option-i: Medical Laboratory Technology

Programme: B.Sc. (Medical)
Semester: VI
Name of the Teacher: Prof. Jaswinder Kaur
Availability Timings: 9:00 AM to 4:30 PM
E-mail: jaswinderkaurzoology@gmail.com

Objectives of the Course:

Main objectives are to educate the students to work in medical laboratory. Medical diagnostic laboratory is the backbone not only to clinician/ doctor but to the patient also. Teaching of Medical Laboratory technology also helps to develop interest in students towards Laboratory work and culture so that they can further pursue higher studies in the field of Lab Technology to be successful lab technicians. Better diagnosis does mean better patient care.

Course Content:

Medical laboratory Safety Rules, Hazards and Precautions
Laboratory techniques
Collection, transportation and preservation of different clinical samples
Haematology, Urine Analysis, CSF and other body fluids and stool examination
Bacteriology and microbial culture and staining techniques
Histopathology – common fixatives and staining techniques
Biochemistry: Principle, theory and significance

Detailed Course Contents: Available at www.gndu.ac.in

What will be the teaching methods:

- Lectures : Four per week
- Student Seminars: One per week
- Assignments : The students will be asked to read the textbook and reference books and write articles on given topics
- PowerPoint Presentations
- Participatory and Experiential Learning
- Quiz

Program Learning Outcomes:

- Proficiency to solve problems and interpret results, and use statistical approaches when evaluating data.

A. Knowledge and Understanding:

Students will understand

- Working in laboratory.

B. Intellectual (Cognitive/ Analytical) Skills:

Students will learn

- Various techniques for analysis of various medical lab samples.
- Working and functioning of various tools involved in analysis of medical lab samples.

C. Practical Skills:

Students will learn:

- Organization of clinical laboratory and role of medical laboratory technicians.

D. Transferable Skills:

Students will be able to

- Work in a team
- Gain practical knowledge
- Effectively communicate to ensure accurate and appropriate information transfer.

Modes of Assessment	Minimum Score Required (to Qualify for the Next Exam/Class)	Schedule
Continuous Internal Evaluation(CIE)		
1.Class Tests (Unit wise)	**40%**	**After Each Unit**
2.Student Seminars		**Every week**
3. In House Exams	**35%**	**Third week of March**
End of Semester Exam	**35%**	**Last week of April/ First**

		week of May onwards

Teaching Outline:

Unit	Teaching Dates
I	**11 January to 4 February**
II	**6 February to 28 February**
III	**4 March to 24 March**
IV	**26 March to 11 April**
Revision	**Till 30 April**

Attendance Policy

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing which they will be detained from appearing in university exams.

Text Book(s):

Sobti, R. C. Medical Zoology & Medical Technology. Shobhan Lal & Company.

References:

1. Baker, F.J. and Silverton, R.E. (1985) Introduction to Medical Laboratory Technology, (6th ed), Butlerworth and Co. Ltd.
2. Chatterjee, K.D. (1995), Parasitology, Protozoology and Helminthology (12th ed).
3. Cheesborough, M. (1987), Medical Laboratory Technology for Tropical countries (2nd ed), Butlerworth and Co., Ltd.
4. Garcia, L.S. (2001), Diagnostic Medical Parasitology, (4th ed), ASM Press Washington.
5. Kimball, J.W. (1986), Introduction of Immunology, MacMillian Publishing Co., New York.
6. Kuby, J. (2000), Immunology, W.H. Freeman & Co., USA.
7. Roitt, I. (1984), Essential Immunology, Blackwell Scientific Publications, Oxford.
8. Talib, V.H. (1999), Essential Laboratory Manual, Mehta Publishers, New Delhi.
9. Talib, V. H. and Khurana, S. R. A Handbook of Medical Laboratory Technology (2nd ed). CBS Publishers& Distributors, New Delhi.
10. Mukherjee, K. L. Medical Laboratory Technology – A Procedure Manual for Routine Diagnostic Tests, Volume – I, II & III. Tata McGraw –Hill Publishing Company Ltd., New Delhi.

E- Resources

https://en.wikipedia.org/wiki/Medical_laboratory_scientist

https://www.microscopemaster.com/bacteriology.html

http://pdfsdir.com/pdfs/medical-laboratory-technology-godkar.pdf

https://www.ebooknetworking.net/books_detail-9350256347.html