

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Science (Diploma / Degree/ Honors)		Semester - III	Session: 2024-2025
1	Course Code	ZOSC-03T	
2	Course Title	Diversity of Invertebrates	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if, any)	As per Program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to - ➤ Develop understanding on Invertebrate Animals on the basis of classification and Nomenclature. ➤ Develop understanding how simple/unicellular animals changed into multicellular and diploblastic forms through their anatomy and physiology. ➤ Gain Knowledge of key processes like formation of triploblastic animals (simple to complex form of body plan). ➤ Develop understanding on parasitic adaptations and life cycle of Helminthes. ➤ Develop understanding on the diversity in Artropoda, Mollusca and Echinodermata.	
6	Credit Value	3 Credits	Credit = 15 Hours - learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) - 45 Periods (45 Hours)			
Unit	Topics (Course contents)		No. of Period
I	General Characters, Classification up to order and Type Study of Phylum Protozoa and Porifera with some special features: Protozoa: General Characters and Classification of Phylum Protozoa up to order. Type study: Paramoecium, Protozoa and Disease. Porifera: General Characters and Classification of Phylum Porifera up to order. Type study: Sycon.		11
II	General Characters, Classification and Type Study of Phylum Coelenterata, Helminthes and Annelida: Coelenterata - General Characters and Classification of Phylum Coelenterata up to order. Type Study: Obelia. Helminthes - Classification of Phylum Helminthes up to order. Type study: Fasciola. Annelida- Classification of Phylum Annelida up to order. Type study: Pheretima (Earthworm).		11
III	General Characters, Classification and Type Study of Phylum Arthropoda and Mollusca: Arthropoda - General Characters and Classification of Phylum Arthropoda up to order. Type study: Prawn. Mollusc- General Characters and Classification of Phylum Mollusca up to order. Type study: Pila.		12
IV	General Characters, Classification and Type Study of Phylum Echinodermata and Hemichordata: General Characters and Classification of Phylum Echinodermata up to order. Type Study: Asterias (Starfish). General Characters and Classification of Phylum Hemichordata Type Study: Balanoglossus		11
Keywords	Taxonomy, Nomenclature, Canal System, Protozoa, Balanoglossus, Torsion		
Signature of Convener & Members (CBoS) :			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- R.L. Kotpal, Modern Textbook of Zoology Invertebrates. Rastogi Publication, Gangotri, Shivaji Road, Meerut
- V.K. Tiwari, Unified Zoology, Shival Agrawal and Company, Pustak Prakashak, Khajuri Bazar, Indore.
- Dr. S.M. Saxsen, Zoology, Ist Year, by a, Ram Prasad and Sons, Aagra and Bhopal.
- N. Arumugam, M.G. Ragunathan, T. Murugan, B. Ramnathan, A Textbook of Invertebrates by Saras Publication

Reference Books Recommended –

- Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
- Boradale, L.A. and Potts, E.A.(1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
- Bushbaum, R. (1964). Animals without Backbones. University of Chicago Press.
- Hyman, L H. (1940-67). The Invertebrates, Vol. I-VI. McGraw-Hill, New York.

Online Resources–

- http://ndl.iitkgp.ac.in/he_document/inflibnet_epgp/inflibnet_epgp/IN_I_e_P_P_1_Z_512_96_P_0_B_o_p_51542_M_1_M_L_c_P_D_a_P_o_E_P_1_51562_51563?e=9*|||

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA):
(By Course Teacher)

Internal Test / Quiz-(2): 20 +20
Assignment / Seminar - 10
Total Marks - 30

Better marks out of the two Test / Quiz
+ obtained marks in Assignment shall be considered against 30 Marks

End Semester Exam (ESE):

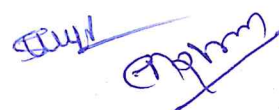
Two section – A & B
Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks
Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:



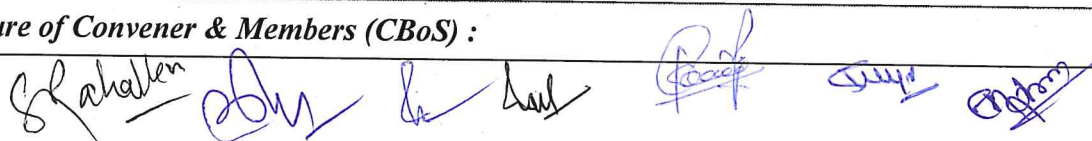






FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in life Science (Diploma / Degree/ Honors)		Semester - III	Session: 2024-2025
1	Course Code	ZOSC-03P	
2	Course Title	Diversity of Invertebrates	
3	Course Type	Discipline Specific Lab Course	
4	Pre-requisite (if, any)	As per Program	
5	Course Learning Outcomes (CLO)	After successfully completing lab course the students will be able to- ➤ Develop understanding on the diversity of life with regard nonchordates. ➤ Gain Knowledge of grouping of animals on the basis of their morphological characteristics. ➤ Develop critical understanding how animals have changed from simple form to complex body plan. ➤ Acquired the detailed knowledge to think and interpret different animal species individually.	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field learning/Training
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
PART -B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course	List of labs to be conducted <ul style="list-style-type: none">• Study of different non-chordate taxa animals through models, slides and museum specimens in the laboratory. Emphasising classification, biogeography and diagnostic features of: Protozoa, Porifera, Coelenterata (also with special reference to Corals of Cnidarians), Helminthes, Annelida, Arthropoda, Mollusca and Echinodermata.• Histological slides of different Non chordate Taxa, slides of various larval forms of Helminthes, Crustacea and Echinodermata• Dissection of <i>Pheretima</i> to expose Alimentary canal and circum pharyngeal ganglia through Alternative methods of dissection.• Dissection of <i>Periplaneta</i> to expose the digestive system, salivary glands and Mouth Parts through Alternative methods of dissection.• Dissection of Prawn to expose appendages and statocyst through Alternative methods of dissection• Dissection of <i>Pila</i> to expose Nervous System through Alternative methods of dissection.• Study of Invertebrate animals in nature during a survey of a National Park/ Forest area/College campus.• Group discussion/Viva or Seminar presentation on two related topics: Polymorphism, Parasitic adaptations, Freshwater sponges, Biodiversity and climate change, Tree of Life, Marine zooplanktons and their ecological importance including oxygen evolution.• An “animal album or Practical Record” containing sketches, photographs, cut outs, with appropriate write up about the above mentioned taxa.• Study of some videos to develop understanding on the animals of different taxa.		30
Keywords	Museum specimens, Histological slides, Alternative of Dissection, Animal album		
Signature of Convener & Members (CBoS) :			



PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- S.S. Lal, Practical Zoology, Invertebrate. 12th Edition Rastogi Publications, Meerut, New Delhi.
- A manual of practical Zoology. Dr. P.S Verma, S. Chand Publication, New Delhi

Reference Books Recommended-

- Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
- Hyman, L H. (1940-67). The Invertebrates, Vol. I-VI. McGraw-Hill, New York.

Online Resources–

- <https://www.youtube.com/watch?v=GC5Ua6m873I>
- <https://www.youtube.com/watch?v=-qvM2Hskj84>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

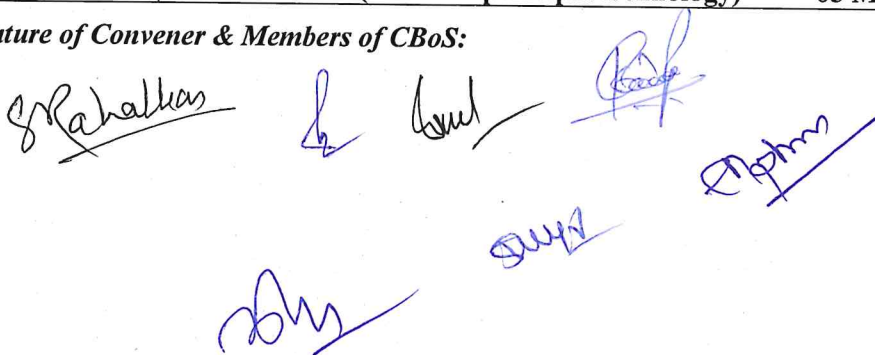
Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar +Attendance - 05	
	Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	
	A. Performed the Task based on lab. work	- 20 Marks
	B. Spotting based on tools & technology (written)	- 10 Marks
	C. Viva-voce (based on principle/technology)	- 05 Marks
	Managed by Course teacher as per lab. status	

Name and Signature of Convener & Members of CBoS:



FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Science (Diploma / Degree/Honors)		Semester - III	Session: 2024-2025
1	Course Code	ZOSE- 01T	
2	Course Title	Parasitology	
3	Course Type	Discipline Specific Elective	
4	Pre-requisite (if, any)	As per Program	
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none">➤ Students should comprehend the life cycles of various parasites, including their modes of transmission, intermediate hosts, and definitive hosts.➤ Gain insights into the interactions between parasites and their hosts; including mechanisms of host invasion, evasion of host defenses, and pathogenesis.➤ Develop the ability to recognize clinical manifestations associated with parasitic infections➤ Understand the epidemiology of parasitic diseases➤ Communicate effectively about parasitic diseases, including educating the public.	
6	Credit Value	3 Credits	Credit = 15 Hours - learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) - 45 Periods (45 Hours)			
Unit	Topics (Course contents)		No. of Period
I	Viral diseases: General characters, Structure and Classification of virus, A brief account of pathogenic viruses. Brief history of microbiology: germ theory of disease, Host pathogen interaction: invasion, antigenic heterogeneity, toxins and enzymes secretions. Viral diseases: hepatitis, influenza, AIDS, Covid -19 with emphasis on their causative agents, pathogenesis, diagnosis, prophylaxis and chemotherapy.		12
II	Bacterial & Fungal diseases: General characters, Structure and Classification of bacteria. Bacterial Diseases: A brief account of pathogenic bacteria, discovery of penicillin, diseases caused by <i>Streptococcus pneumonia</i> , <i>Salmonella typhi</i> , <i>Escherichia coli</i> , <i>Mycobacterium tuberculosis</i> , <i>Rickettsia</i> , <i>Spirochaetes</i> Fungal diseases: Ringworm infection, <i>Aspergillosis</i> , <i>candidiasis</i> .		11
III	Protozoan parasites: An overview of protozoa & disease. Introduction to parasites and parasitic diseases. Mode of transmission, portals of entry and implications of parasitism. Parasitic adaptations. Concept of zoonotic diseases. Protozoan diseases of medical importance: Brief account of life History, pathogenicity of the following Protozoa with reference to Man, prophylaxis and treatment: <i>Entamoeba histolitica</i> , <i>Trypanosoma gambiens</i> , <i>Plasmodium vivex</i> , <i>Giardia</i> .		11
IV	Helminth parasites: An overview of Helminthic diseases. Brief account of life History, pathogenicity of the following Helminths with reference to Man, prophylaxis and treatment. <i>Taenia solium</i> , <i>Schistosoma haematobium</i> , <i>Ascaris lumbricoides</i> , <i>Wuchereria branrofti</i> . Vector insects.		11
Keywords	Micrology, pathogenic bacteria, Protozoan parasites, Helminth parasites, Toxicology, toxic againts		
Signature of Convener & Members (CBoS) :			

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- Agrawal Anju Principles of Toxicology
- Parija, S. C. (2013) Textbook of Medical Parasitology, Protozoology & Helminthology (Text and colour Atlas), IV Edition, All India Publishers & Distributors, New Delhi.
- Ichhpujani, R.L. and Bhatia, R. (2009) Medical Parasitology. III Edition, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi
- Ahmed, N., Dawson, M., Smith, C. and Wood, Ed. (2007) Biology of Disease. Taylor and Francis Group.
- Chatterjee, K. D. (2009). Parasitology: Protozoology and Helminthology. XIII Edition, CBS Publishers & Distributors (P) Ltd.
- Arora, D. R and Arora, B. (2001) Medical Parasitology. II Edition. CBS Publications and Distributors
- Chatterjee, K.D (2015) Parasitology (13th edition)

Reference Books Recommended –

- Jawetz, M. and Adelberg (2015) Medical Microbiology (27th edition)
- Noble, E.R. and Noble, G.A. (1989) Parasitology: The Biology of Animal Parasites. VI Edition, Lea and Febiger

Online Resources–

- http://ndl.iitkgp.ac.in/he document/inflibnet epgp/inflibnet epgp/IN I e P P 1 Z 512 96 P 0 B o p 51542 M 1 M L c P D a P o E P 1 51562 51563?e=9|*||
- http://ndl.iitkgp.ac.in/he document/inflibnet epgp/inflibnet epgp/IN I e P P 1 Z 512 96 P 0 B o p 51542 M 2 P d a p o w b 51594 51595?e=3|*||

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:






Maximum Marks: 100 Marks


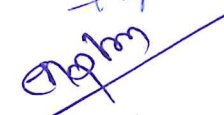
Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10 Total Marks - 30	
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark ; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit- 4x10=40 Marks	

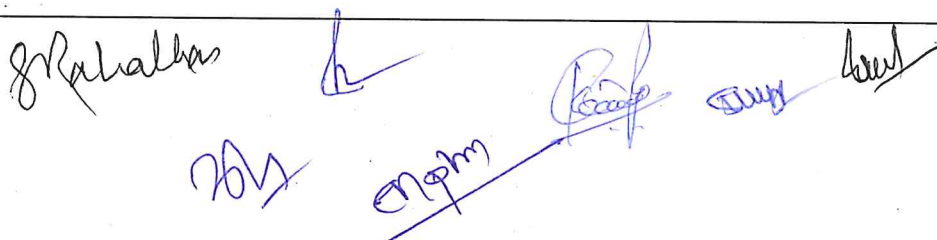
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COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Science (Diploma / Degree/ Honors)		Semester - III	Session: 2024-2025
1	Course Code	ZOSE- 01P	
2	Course Title	Parasitology	
3	Course Type	Discipline Specific Elective Lab Course	
4	Pre-requisite (if, any)	As per Program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able - ➤ Identify common parasitic Protozoa and Helminth. ➤ Learn techniques for studying growth of bacteria and its staining. ➤ Learn the techniques for examine Sputum, Blood, Urine and Stool samples for pathology	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field learning/Training
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
PART -B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course	<ul style="list-style-type: none">➤ Study of permanent slides and specimens of parasitic Protozoans and Helminthes.➤ Pathological examination of sputum, blood, urine and stool.➤ Blood: Erythrocyte Sedimentation Rate (ESR), Haematocrit.➤ Staining and identification of Gram positive and Gram negative bacteria.➤ Preparation of thin and thick blood films to diagnose Plasmodium infections/ or permanent slides.➤ Preparation of temporary and permanent slides of faecal matter by saline preparation and concentration techniques to identify cysts of parasitic Protozoans and Helminthes eggs /or parmanant slides studies.➤ Study Kinetics of bacterial growth and staining techniques.➤ Group discussion or Seminar presentation on one or two related topics➤ Group discussion/quiz/seminar on topics related to theory.➤ Preparation of practical record or Album of parasites.		30
Keywords	Parasitic protozoa, helminth, ESR, Gram positive and Gram negative		
Signature of Convener & Members (CBoS) :			



PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- Ghosh Saugala, Panikar's Text book of Parasitology. Jaipye Brothers
- Ananthanarayan and Paniker's Textbook of Microbiology, Twelfth Edition, Universities press

Reference Books Recommended –

- K.D. Chattarjee, Parasitology . CBS Publisher

Online Resources–

- http://ndl.iitkgp.ac.in/he document/swayam ugc moocs/swayam ugc moocs/IN S U M 1 U C 17 A D 4127 M L h o A L w P A o A L 34326 34327?e=7|*||
- http://ndl.iitkgp.ac.in/he document/swayam ugc moocs/swayam ugc moocs/IN S U M 1 U C 17 A D 4127 M L h o T s a F h 10250 10251?e=8|*||

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

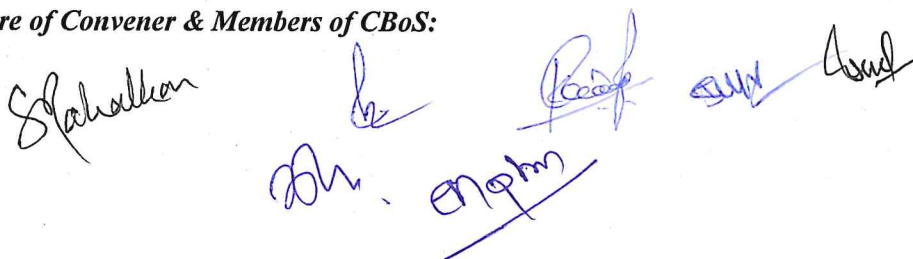
Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

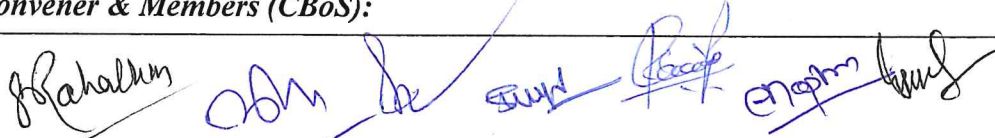
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar +Attendance - 05 Total Marks -	

Name and Signature of Convener & Members of CBoS:



FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program:Bachelor (Certificate / Diploma / Degree)		Semester – I/III/V	Session: 2024-2025
1	Course Code	ZOVAC-01	
2	Course Title	Public Health and Hygiene	
3	CourseType	Value Added Course	
4	Pre-requisite(if, any)	As per Program	
5	Course Learning Outcomes(CLO)	<div>➤ Understand the importance of hygiene.</div> <div>➤ Identify current national and global public health problems.</div> <div>➤ Aware about the issues of food safety, water safety, vaccination, and obesity.</div> <div>➤ Create general medical awareness in daily life.</div> <div>➤ Analyze the measures to live a healthy life.</div>	
6	CreditValue	2 Credits	Credit = 15 Hours -learning & Observation
7	TotalMarks	Max.Marks:50	Min Passing Marks:20
PART -B: Content oftheCourse			
Total No. of Teaching–learning Periods (01 Hr. per period) - 30 Periods (30 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Maintenance of personal hygiene: Introduction to public health and hygiene: determinants and factors. Pollution and health hazards: Water and air borne diseases. Radiation hazards: Network Towers and electronic gadgets (recommended levels, effects and precaution). Personal hygiene: Oral hygiene, Menstrual Hygiene, Ideal hand washing methods, Ideal food keeping methods.		07
II	Nutrition and Health: Classification of food into micro and macro nutrients. Balanced diet. Importance of dietary fibres. Significance of breast feeding. Malnutrition anomalies: Anaemia (Iron and B12 deficiency), Kwashiorkar, Marasmus, Rickets, Goiter (cause, symptoms, precaution and cure).		07
III	Communicable/Contagious and Non-Communicable Diseases: Communicable viral diseases: measles, chicken pox, swine flu (their causal agents, symptoms and prevention). Communicable bacterial diseases: tuberculosis, typhoid, cholera (their causal agents, symptoms and prevention). Sexually transmitted diseases: AIDS, Syphilis (their causal agents, symptoms and prevention). Non-communicable diseases: hypertension, arthritis, Diabetes, peptic ulcer, obesity, depression and anxiety (their causal agents, symptoms and prevention).		09
IV	Public Health Management & General Medical Awareness: Vaccination, Benefits of institutional deliveries, Deworming drive: Use of Albendazole. First Aid: Electrocution, Road Accident, Burn, Lightning Strike, Envenomation. Importance of Cardiopulmonary resuscitation (CPR). Blood Donation: Eligibility, Health Screening. Road Safety: Good Samaritan, General safety precautions on Road and Motion Sickness. Fire Safety: Fire Control and Fire Extinguisher Categories.		07
Keywords	Health, Hygiene, Nutrition, Disorders, Vaccination, Safety, Fire, Blood, Medication.		
Signature of Convener & Members (CBoS):			



PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- Mary Jane Schneider (2011) Introduction to Public Health.
- Muthu, V.K. (2014) A Short Book of Public Health.

Reference Books Recommended

- Detels, R. (2017) Oxford Textbook of Public Health (6th edition).
- Gibney, M.J. (2013) Public Health Nutrition.
- Wong, K.V. (2017) Nutrition, Health and Disease.

Online Resources–

- <https://www.fda.gov/drugs/investigational-new-drug-ind-application/general-drug-categories>
- <https://www.nfpa.org/news-blogs-and-articles/blogs/2023/08/01/fire-extinguisher-types>
- <https://www.redcross.org/take-a-class/cpr/performing-cpr/what-is-cpr#:~:text=What%20Is%20the%20Purpose%20of,healthcare%20workers%20and%20emergency%20responders.>
- <https://unesdoc.unesco.org/ark:/48223/pf0000226792>

Online Resources–

- https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S001827/P001833/M029447/ET/15245666876.21Q1.pdf
- https://www.nhm.gov.in/images/pdf/programmes/mhs/Training_Materials/PDF_English/reading_material.pdf

PART-D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance- 05 Total Marks -15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 05 x 1 = 05 Mark; Q2. Short answer type- 5 x 2 = 10 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit- 4 x 05 = 20 Marks	

Name and Signature of Convener & Members of CBoS:

