Baba Farid University of Health Sciences

Ordinances

Bachelor of Science in Anatomy, Physiology & Biochemistry
B.Sc.(APB)

(3 Years Degree Programme)

(Applicable w.e.f. academic session 2019-20)

Faridkot -151203

Ordinances
Bachelor of Science in Anatomy, Physiology & Biochemistry
B.Sc. (APB)

1. Duration of course

Duration of course shall be 3 years.

2. Admission criteria and qualifications:

The students shall be admitted as per the admission criteria and qualifications prescribed in the Notification issued by the Government of Punjab or by Baba Farid University of Health Sciences, from time to time.

3. Medium of Instructions

The medium of instruction during the course and examinations shall be English.

4. Examination Schedule

4.1 The examination shall be held twice a year in the months of May/June and November/December or on such other dates as may be decided by the Board of Management on the recommendation of Faculty of Medical Sciences and Academic Council.

4.2 Normally, the University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than four and not more than six months between the two examinations.

4.3 Normally, the last dates for receipt of examination form and late fee in the University Office shall be as under:-

Examination Session	Date for without late fee	Date with late fee of Rs.200/-	Date with late fee of Rs.500/-	Date with late fee of Rs.1500/-
May/June	March 1	March 15	March 31	April 15
Nov./Dec.	Sept. 15	Sept. 30	Oct. 15	Oct. 31

4.4 In the case of late declaration of result due to any reason, the last dates for receipt of examination form and fee in the University Office shall be as under:-

Up to 15 days from the date of declaration of result	Up to 30 days from the date of declaration of result	Up to 45 days from the date of declaration of result	Up to 60 days from the date of declaration of result
Without Late Fee	With a late fee of Rs.200/-	With a late fee of Rs.500/-	With a late fee of Rs.1500/-

Note: 1. Examination Fee including cost of form should be submitted in the shape of Demand Draft in favour of "The Registrar, BFUHS" payable at Faridkot.

2. The Vice chancellor may permit acceptance of admission form and fee ten days before the commencement of examination with a late fee of Rs.5000/.

5. First Year B.Sc. Anatomy, Physiology & Biochemistry Examination:

The First Year B.Sc. Anatomy, Physiology & Biochemistry Examination shall be open to a person who

a) has been enrolled for one academic year preceding the examination in a College of Health Sciences affiliated to this University.

b) has his/her name submitted to the Registrar by the Principal of the college with the following certificates:-

i) of having attended separately in theory and practical/clinical not less than 75% of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 5% of the lectures delivered.

ii) of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.

iii) of good moral character.

Note: If a candidate fulfils the condition laid down in clause 5(a) & (b) above for one or more subject (s) he/ she may be allowed to take the examination in such subject (s) in which he/ she fulfils the requirements.

(c) The First Year B.Sc. Anatomy, Physiology & Biochemistry Annual Examination shall be held in May/June and the supplementary within six months of the annual examinations.

d) The First Year B.Sc. Anatomy, Physiology & Biochemistry examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Sr. No.	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Oral/Viva	Total	Marks	Int. Assessment	Total	
1.	Anatomy	100	20	20	140	40	20	60	200
2.	Physiology	100	20	20	140	40	20	60	200
3.	Biochemistry	100	20	20	140	40	20	60	200
4.	Medical Statistics & Research Methodology	80	20	-	100	-	-	-	100
5.	English*	80	20	-	100	-	-	-	100

*Note: The Examination in the subject of English will be conducted at College level and minimum pass marks shall be 35% and marks will be sent to the University for final inclusion in the result.

6. Second Year B.Sc. Anatomy, Physiology & Biochemistry Examination:

The Second Year B.Sc. Anatomy, Physiology & Biochemistry Examination shall be open to a person who

a) has been enrolled for one academic year preceding the examination in a College of Health Sciences affiliated to this University.
b) has previously passed the First Year B.Sc. Anatomy, Physiology & Biochemistry examination of this University or an examination of any other recognized University/Institution in India considered equivalent for the purpose by the University.
c) has his/her name submitted to the Registrar by the Principal of the college with the following certificates:-

i) of having attended separately in theory and practical/clinical not less than 75% of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 5% of the lectures delivered.
ii) of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.
iii) of good moral character.

Note: If a candidate fulfils the condition laid down in clause 6 (a), (b) and (c) above for one or more subject (s) he/ she may be allowed to take the examination in such subject (s) in which he/ she fulfils the requirements.

(d) The Second Year B.Sc. Anatomy, Physiology & Biochemistry Annual Examination shall be held in May/June and the supplementary within six months of the annual examinations.

(e) The Second Year B.Sc. Anatomy, Physiology & Biochemistry examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Sr. No.	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Oral/Viva	Total	Marks	Int. Assessment	Total	
1.	Anatomy	100	20	20	140	40	20	60	200
2.	Physiology	100	20	20	140	40	20	60	200
3.	Biochemistry	100	20	20	140	40	20	60	200
4.	Computer & Computer Application*	-	-	-	-	80	20	100	100

* There shall be no University examination in the subject of Introduction to Computer. Examination will be conducted at college level and marks will be sent to the University for final inclusion in the result.

7. Third Year B.Sc. Anatomy, Physiology & Biochemistry Examination:

The Third Year B.Sc. Anatomy, Physiology & Biochemistry Examination shall be open to a person who

a) has been enrolled for one academic year preceding the examination in a College of Health Sciences affiliated to this University.

b) has previously passed the Second Year B.Sc. Anatomy, Physiology &Biochemistry examination of this University or an examination of any other recognized University/Institution in India considered equivalent for the purpose by the University.

c) his/her name submitted to the Registrar by the Principal of the college with the following certificates:-

i) of having attended separately in theory and practical/clinical not less than 75% of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 5% of the lectures delivered.

ii) of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.

iii) of good moral character.

Note: If a candidate fulfils the condition laid down in clause 7 (a), (b) & (c) above for one or more subject (s) he/ she may be allowed to take the examination in such subject (s) in which he/ she fulfils the requirements.

(d) The Third Year B.Sc. Anatomy, Physiology & Biochemistry Annual Examination shall be held in May/June and the supplementary within six months of the annual examinations.

(e) The Third Year B.Sc. Anatomy, Physiology & Biochemistry examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Sr. No.	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Oral/Viva	Total	Marks	Int. Assessment	Total	
1.	Anatomy	100	20	20	140	40	20	60	200
2.	Physiology	100	20	20	140	40	20	60	200
3.	Biochemistry	100	20	20	140	40	20	60	200
4.	Psychology & Education	80	20	-	100	-	-	-	100

8. Internal Assessment

i) Internal Assessment shall be submitted to the University at least two weeks before the commencement of theory examinations or within one week from the issuance of Roll Numbers by the University. All the colleges shall adopt uniform criteria for Internal Assessment as follows:-

a) Attendance above 90% to be acknowledged with 10% extra weight-age for Internal Assessment.

b) At least two tests to be held in each year in addition to the pre-final (send up) examination. The Internal Assessment should be the average of all awards of these tests taken together.

c) Criteria for calculation of Internal Assessment

i)	House Examinations	- 80%
ii)	Attendance (above 90%)	- 10%
iii)	Subject assessment (candidate's conduct and extra curricular participation)	- 10%

d) Additional mandatory requirement for Internal Assessment to be observed by all colleges.

i) All test marks obtained by candidates will be displayed on Notice Boards of respective departments as and when they are awarded.

ii) All computations of Internal Assessment of the entire class made by the HOD of the department shall be displayed on the notice board of the department showing individual test marks, advantage of all tests, attendance advantage and subjective assessment and the total Internal Assessment thus derived for at least one week before sending the awards to the Principal's office.

iii) Professor Incharge/HOD preparing Internal Assessment shall certify that the detailed assessment of the entire class has been displayed on the department Notice Board for at least one week prior to its being submitted for onward transmission to the University and that adequate opportunity has been given to all the students to file any objections and that the same have been addressed satisfactory.

iv) The Principal forwarding the Internal Assessment to the University shall countersign the above referred certificate of the HOD/Professor Incharge preparing the Internal Assessment.

e) The re-appear/fail students may be re-assessed for improvement in the Internal Assessment and awards of Internal Assessment of all the re-appear/fail students will be submitted to the University every time.

9. Promotion and number of attempts allowed

a) A candidate who fails in all the subjects in the First Year B.Sc. Anatomy, Physiology & Biochemistry examination shall not be promoted to Second Year class.

b) The candidate who will absent himself/herself from the examination will be deemed to have been failed in that subject.

c) A candidate who passes in at least one subject of University level First Year B.Sc. Anatomy, Physiology & Biochemistry examination will be permitted to attend classes of Second Year. However, he/she will be allowed to appear in the Second Year B.Sc. Anatomy, Physiology & Biochemistry examination only after passing all the subjects of First Year B.Sc. Anatomy, Physiology & Biochemistry Examination.

d) Candidate who passes in one or more subjects of First Year B.Sc. Anatomy, Physiology & Biochemistry examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), failing which he/ she shall not be allowed to continue his studies.

e) A candidate who fails in all the subjects in the Second Year B.Sc. Anatomy, Physiology & Biochemistry examination shall not be promoted to Third Year class.

f) A candidate who passes in at least one subject of University level Second Year B.Sc. Anatomy, Physiology & Biochemistry examination will be permitted to attend classes of Third Year. However, he/she will be allowed to appear in the Third Year B.Sc. Anatomy, Physiology & Biochemistry examination only after passing all the subjects of Second Year B.Sc. Anatomy, Physiology & Biochemistry Examination.

g) Candidate who passes in one or more subjects of Second Year B.Sc. Anatomy, Physiology & Biochemistry examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts including first attempt, as a regular candidate plus one mercy chance at the discretion of the Vice-Chancellor, failing which he/ she will have to appear in all the subjects of the examination.

h) Candidate who passes in one or more subjects of Third Year B.Sc. Anatomy, Physiology & Biochemistry examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), failing which he/ she will have to appear in all the subjects.

10. Appointment of Examiners:

The examiners shall be appointed by the University on the recommendations of the Board of Studies in Medical Sciences (Undergraduates)/Faculty of Medical Sciences.

i) There shall be four examiners – two internal and two external.

ii) Professor& Head of the Department shall be the Convener. The second Internal Examiner will be appointed by annual rotation from amongst the Professors/Associate Professors/Assistant Professor with at least 3 years post PG teaching experience. In case of non-availability of Professors/Associate Professors/Assistant Professor in the department the teacher working in another Medical College affiliated to this University, who fulfils the minimum requirements as per MCI norms for appointment as examiner may be appointed as Internal Examiner.

iii) The examiners shall be appointed by the University from the teachers working in the Medical Colleges affiliated to it, preferably from the colleges where this course is being run, on the recommendations of the Board of Studies in Medical Sciences and Faculty of Medical Sciences.

iv) In case of non-availability of External Examiners from amongst the affiliated colleges of BFUHS, External Examiners may be appointed from the colleges which are not affiliated to BFUHS, Faridkot, in and outside the State of Punjab.

11. Paper setting and moderation of Question Papers

Each theory paper shall be of three hours duration. The paper setting and moderation of Question Papers will be got done under the direction of the Vice-Chancellor, if necessary.

The question paper covering the entire course shall be divided into two sections. **All the questions shall be compulsory.**

Section A:

Question 1: This will consist of one long answer questions with answer up to 1000 words in length. This question will carry 20 marks.

Question 2: This will consist of one long answer questions with answer up to 500 words in length. This question will carry 10 marks.

Question 3: This will consist of four short answer questions with answer to each question up to 250 words in length. All questions will be compulsory. Each question will carry 5 marks total weight-age being 20 marks.

Section B

Question 1: This will consist of one long answer questions with answer up to 1000 words in length. This question will carry 20 marks.

Question 2: This will consist of one long answer questions with answer up to 500 words in length. This question will carry 10 marks.

Question 3: This will consist of four short answer questions with answer to each question up to 250 words in length. All questions will be compulsory. Each question will carry 5 marks total weight-age being 20 marks.

12. Evaluation of Answer Books

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (table marking) or any other method under the direction of the Vice-Chancellor.

13. Minimum pass marks:

The minimum number of marks to pass the examination shall be 50% in theory including Internal Assessment & Oral/Viva and 50% in practical including Internal Assessment in each subject separately except in the subject of English where minimum pass marks shall be 35%.

A successful candidate on the basis of theory and practical marks taken together shall be classified as under: -

Second Class : A candidate obtaining 50% or more marks but less than 60% marks
First Class : A candidate obtaining 60% or more marks
First Class with Distinction : A candidate obtaining 80% or more marks

14. Grace Marks:

That the grace marks up to 5 (five) be given to the best advantage of the students irrespective of Theory or Practical examinations.

15. Declaration of Result

The Registrar/Controller of Examinations shall publish the result after the examination. The candidates shall be issued Detailed Marks Certificate through their Principals.

16. Award of Degree

On successfully passing the Third Year B.Sc. (APB) examination the students shall be awarded the Degree of Bachelor of Science in Anatomy, Physiology & Biochemistry.

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Syllabus B.Sc. (APB) First Year

PAPER – I : ANATOMY

Theory (150 hours)

1. Gross Anatomy of Thorax and Upper Extremity, Surface Anatomy, Radiological Anatomy and Applied Anatomy of these parts is also included.
   (Gross anatomy will also include relevant Osteology, Arthrology & Myology)
2. Histological Studies of the tissues of the body such as epithelial tissue, connective tissue, muscle tissue and nervous tissue, skin, bone and cartilage, Lymphatic system
3. General human Embryology
4. Study of General Anatomy (Basic Anatomy) such as of skin, fascia, muscle, bone, cartilage, joints etc.
5. Special (Systemic) Histology of Cardiovascular & Respiratory system
6. Special (Systemic) Embryology of Cardiovascular & Respiratory system, branchial arches

Practical Work (400 hours)

1. Practical work will include dissection of Upper Extremity and Thorax of human cadavers.
2. Study of General Embryology models, special embryology, models of cardiovascular & Respiratory System.
3. Study of Histology slides of epithelial tissue, connective tissue, muscle tissue, nervous tissue, skin bone and cartilage & Lymphatic system, Cardiovascular & Respiratory system
4. The record of the practical work done (dissection, histology etc.) shall be maintained in the form of practical note books.
5. In the oral and practical examinations. There will be a viva on the dissected regions, bones, other soft parts relating to the above mentioned regions of the body. Viva on embryology models and Identifications of histological slides as mentioned above. Examinations of X-ray films from the above regions.
6. The candidates will have to submit a certificate signed by the Head of the Department showing that the candidate has done the practical work and has the requisite attendance in theory and practical to the satisfaction of the Head of the Department.

Books recommended

1. Human Anatomy Vol.1,2,3 , BD Chaurasia-Latest edition
2. Cunningham's Manual of practical Anatomy- Vol. 1, II & III – Latest edition
3. The Practice Manual of Illustrative Anatomy- S.Kakkar,A.Tuli. S.Rehaja-3rd Edition
4. A Textbook of Histology by Krishna Garg, I. Bahl, M. Kaul - Latest edition
5. Atlas of Human Histology by Difiore - Any edition
6. Human Embryology – Inderbir Singh
7. Handbook of General Anatomy by Krishna Garg
8. Essential of Genetics by Renu Chauhan
9. Surface and Radiological Anatomy with a clinical perspective –Ashwini C. Appaji, Roopa Kulkarni
10. Clinical Anatomy by Richard Snell-Latest edition
11. Clinical Neuroanatomy by Richard Snell - Latest edition

Reference Books

Gray's Anatomy-Latest edition

Syllabus B.Sc. (APB) First Year

PAPER – II: PHYSIOLOGY

Theory (200 hours)

1. Introduction and history of Physiology
2. The Internal Environment of the body
3. The cell and its function – structure of cell membrane and transport across it
4. Digestive system
5. Blood
6. Body Water
7. Excretory System
8. Temperature Regulation

Practical Work (150 hours)

1. Study of Microscope
2. Estimation of Haemoglobin
3. Blood film preparation and DLC, WBC & RBC counts.
4. Calculations and interpretation of MCH, MCHC, MCV, Color Index
5. BT & CT.
6. Blood Grouping and matching
7. Demonstrations – Reticulocyte Count, Platelet Counts, ESR, PCV.
8. Recording of Body Temperature

Books Recommended

1. Text Book of Medical Physiology by Arthur C. Guyton - Latest Edition
2. Review of Medical Physiology by WF Ganong – Latest Edition
3. A Text Book of Practical Physiology by CL Ghai
4. Manual of Practical Physiology by Prof. AK Jain.
5. Text Book of Medical Physiology for undergraduates by Indu Khurana
6. Medical Physiology Vol. I and II by Dr Sabyasachi Sircar
7. Practical Workbook of Human Physiology by Sri Nageshwari, Rajeev Sharma
8. Manual of Practical Physiology by Prof. A.K. Jain.
9. Experimental manual for computer based amphibian experiments: K. Sri Nageshari, Syamala Devi, Rajeev Sharma.

Syllabus B.Sc. (APB) First Year

PAPER – III : Biochemistry

Theory (150 hours)

1. Physio-chemical principles, concept of pH and blood buffers. Colliods, surfacr tension, osmotic pressure and Donann's equilibrium.
2. Carbohydrates – importance, classification, general reations of monosaccharides, oligosaccharides and polysaccharides and Mucopolysaccharides.
3. Lipids – importance, classification, general reactions of fatty acids, glycerol, neutral fats, phospholoids and sterols.
4. Aminoacids and Proteins – classification, general properties, structure and functions.
5. Nucleic Aicd – importance, structure and properties of pyrimidines, purines, nucleotides and nucleic acids.
6. Enzymes – classification, factors affecting enzyme activity, enzyme inhibition & coenzymes.
7. Plasma Proteins
8. Detoxification mechanism
9. Radioisotopes in Medicine

Practical Work (50 hours)

1. Preparation of buffer solutions and determination of pH with the help of standards and pH meter.
2. Reactions and qualitative tests for carbohydrates
3. Reactions and qualitative tests for fats
4. Reactions and qualitative tests for proteins
5. Reactions and qualitative tests for aminoacids
6. Gastric juice analysis
7. Spectroscopic examination of haemoglobin and its derivatives, preparation of Hematin Crystals.
8. Urine – physical properties, normal and abnormal constituents

Books Recommended

1. A Review of Biochemistry by Harper
2. Biochemistry of A Lehinger
3. Practical Clinical Biochemistry by Harold Varley
4. Practical Biochemistry by VK Malhotra
5. Biochemistry by Satyanarayan
6. Biochemistry by Dr Dinesh Puri
7. Clinical Biochemistry (Medical Laboratory Tecniques for routine diagnostic Tests) Vol. VII by G. Rury (Project Co-ordinator) NCERT.
8. Text book of Biochemistry by Edward S. West, Wilbert R. Todd, Haward S. Mason and John J. Van Druggson
9. Hawk's Physiological Chemistry by Bernard L. Oser
10. Biochemistry of nucleic Acids by Adams, Burdon, Campbell Leader and Smethie

Syllabus B.Sc. (APB) First Year

PAPER – IV : Medical Statistics & Research Methodology

Theory (100 hrs)

1. Statistical Treatment of Data

    - Mean, Average, mode, median, confidence limits, percentiles, standard deviation, standard error, test of significance (t , z and Chisqure tests).

2. Preparation of Scientific Reports
3. Experimental design
    - Construction of hypothesis, sample design, census method of investigation
    - Sampling Method: random, purposive, selection, stratified, quota, multistage, convenience sampling problems of representative sample.
4. Collection of Data :Common method of data collection.

Books Recommended:

1. Research Methodology : Method & Techniques by CR Kothari
2. Methods in Biostatistic by BK Mahajan
3. Statistical Method in Biology by Bailey
4. Method in Social Research by William J Goode and Paul K Hatt.
5. Statistical Methods by George W. Snedecor and William G. Cochran
6. Method of Social Survey of Research by Bajpai
7. Statistical Calculations for Beginners by Chambers
8. Statistical Methods of Medical and Biological Studies by Dahlbarg

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Syllabus B.Sc. (APB) First Year

PAPER - V

ENGLISH

Theory : 35 hours

Communication:-

Role of communication Defining Communication Classification of communication Purpose of communication
Major difficulties in communication Barriers to communication
Characteristics of successful communication – The seven Cs Communication at the work place
Human needs and communication "Mind mapping" Information communication

Comprehension passage:-

Reading purposefully
Understanding what is read
Drawing conclusion
Finding and analysis

Explaining:-

How to explain clearly
Defining and giving reasons
Explaining differences
Explaining procedures
Giving directions

Writing business letters:-

How to construct correctly
Formal language
Address
Salutation
Body
Conclusion

Report writing:-

Reporting an accident
Reporting what happened at a session
Reporting what happened at a meeting

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Syllabus B.Sc. (APB) Second Year

PAPER – I : ANATOMY

Theory **(150 hours)**

1. Gross Anatomy of Lower Extremity and Abdomen including osteology, Arthrology, Myology, Blood Supply, lymphatic Drainage and nerve supply. Surface Anatomy, Radiological Anatomy and Applied Anatomy of these parts is also included. (Gross anatomy will also include of relevant Osteology, Arthrology & Myology)
2. Special (systemic) Embryology of Urogenital and Alimentary system.
3. Special (systemic) Histology of Urogenital and Alimentary system.

Practical Work **(400 hours)**

1. Practical work will include dissections of lower extremity and abdomen of a human cadavers
2. Study of histological slides of Alimentary system and Urogenital system.
3. Study of special (Systemic) Embryology models Alimentary system and Urogenital system.
4. The record of the practical work done (dissection, histology etc.) shall be maintained in the form of practical note books.
5. In the oral and practical examination. There will be viva on the dissected regions, bones, other soft parts relating to the above mentioned regions of the body. Viva on special Embryology and Anthropology, Identification of histology slides of the systems noted above. Surface and Radiological Anatomy of the regions dissected will be also be a part of the practical examination.
6. The candidates will have to submit a certificate signed by the Head of the Department showing that the candidate has done the practical work and has the requisite attendance in theory and practical to the satisfaction of the Head of the Department.

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Syllabus B.Sc. (APB) Second Year

PAPER – II : PHYSIOLOGY

Theory (200 hours)

1. Nerve-muscle Physiology and Bio-potentials
2. Respiratory System
3. Cardiovascular System
4. Nutrition and Vitamins
5. Ageing and Growth

Practical Work (150 hours)

1. *Experiments of frog's never-muscle preparation: simple muscle twitch, effect of temperature, strength, effect of load, two successive Stimuli, velocity of impulse fatigue.
2. *Frog's heart. Cardiogram. Effect of temperature. Effect of drug. Properties of Heart: Refractory period. Vago-sympathetic stimulation. Vagal escape. Stannius ligatures. Perfusion of heart. Spinal frog and decreberate frog
3. Cardiovascular System:
   - Examination of CVS
   - Recording of arterial blood pressure and effect of posture & exercise on it.
   - Clinical examination of Pulse & Jugular venous pulse
4. Respiratory System:
   - Examination of Respiratory System
   - Recording of respiratory movements by stethography & effect of variants
   - Recording of vital capcity & effect of posture
   - Recording of Lung Volume and capacities on spirometer.
5. Recording of ECG – Demonstration
6. Recording of Nerve Conduction Velocity – Demonstration

* No.1 & 2 through simulation software

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Syllabus B.Sc. (APB) Second Year

PAPER – III: Biochemistry

Theory (150 hours)

1. Metabolism of carbohydrates
2. Metabolism of lipids
3. Metabolism of amino acids
4. Metabolism of purines and pyrimidines
5. Water and mineral metabolism
6. Hormones – Chemistry and functions
7. Enzymes : Clinical Enzymology, metalloenzymes and Isoenzymes
8. Biological Oxidation, electron transport chain, Mechanism of oxidative – Phosphorylation, Inhibitors of O/P and E.T.C.

Practical Work (50 hours)

1. Urine – quantitative measurement of chloride, creatinine, sugar, urea, proteins.
2. Blood serum – estimation of true blood glucose, urea, creatinine, phosphate, calcium, uric acid, serum cholesterol, bilirubin (direct and indirect) and proteins (total and differential).

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Syllabus B.Sc. (APB) Second Year

PAPER – IV : Computer and Computer Application

Practical (100 hours)

1. Anatomy of a Computer and Basic Structural Components
2. Physiology of a Computer :Operating Systems
   - Basic/Brief knowledge about the various operating systems used in a computer (Windows, Linux, Mac etc.)
3. Microsoft Power Point
4. Microsoft Word
5. Microsoft Excel
6. Microsoft Access
7. Basic knowledge of utility of Multi Media
8. Internet and its applications

Books recommended

1. Computers in Medicine by Dr Naval Kishore, Vikas Publishing House P. Ltd., New Delhi
2. A Beginners Guide to Computers by Alexis Leon and Mathews Leon, vikas Publishing House Pvt. Ltd. New Delhi
3. Computers our Future by Gurpreet Singh Grewal, Nova Publications, Darya Ganj, New Delhi (Set of 5 books for 6^{th} to 10^{th} Class of Punjab State Education Board).

Syllabus B.Sc. (APB) Third Year

PAPER – I : ANATOMY

Theory (150 hours)

1. Gross human anatomy of head, Neck and Brain. Surface Anatomy , radiological Anatomy and Applied Anatomy of these parts is also included.
   (Gross anatomy also includes relevant Osteology, Arthrology & Myology)
2. Special (Systemic) Embryology of special senses, nervous system, Ductless gland and face.
3. Microscopic Anatomy of endocrine glands, Salivary glands, Nervous system and special senses.
4. Human Genetics (Medical Genetics)

Practical Work **(400 hours)**

1. Dissection of Head, Neck and Brain
2. To study the models of special (systemic) Embryology of special senses, nervous system, Ductless glands, face and branchial plexus.
3. To study histology slides of Endocrine glands, Salivary glands, Nervous system and special senses.
4. In the oral and Practical examinations. There will be viva on this and also on bones and soft parts relating to regions mentioned in the theory syllabus. Viva on special embryology and identification and viva on histology slides as mentioned in the theory syllabus. Surface Anatomy and Radiological Anatomy of the parts dissected will also be part of examination.
5. The candidates will have to submit a certificate signed by the Head of the Department showing that the candidate has done the practical work and has the requisite attendance in theory and practical to the satisfaction of the Head of the Department.

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Syllabus B.Sc. (APB) Third Year

PAPER – II : PHYSIOLOGY

Theory (200 hours)

1. Endocrines
2. Reproduction
3. Nervous System
4. Special senses

Practical Work (150 hours)

Central Nervous System:

1. General Neurological Examination & Examination of Higher Functions
2. Examination of the Sensory System
3. Examination of the Motor system
4. Elicitation of Reflexes
5. Examination of the Cranial Nerves
6. Perimetry : Mapping out of the visual field, Blind spot
7. Acuity of vision
8. Colour Vision
9. Tests of Hearing

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Syllabus B.Sc. (APB) Third Year

PAPER – III: Biochemistry

Theory (150 hours)

1. Biophysical chemistry – Thermodynamics of biochemical reactions, molecular weight, high energy bond, chromatography, electrophoresis, colorimetry, flourimetry, viscosity, ultracentrifugation and dialysis
2. Principles of immunology
3. Muscle contraction
4. Liver function tests and kidney function tests
5. Molecular genetics – replication, transcription, translation, gene regulation and recombinant technology
6. Haem-synthesis

Practical Work (50 hours)

1. Urea clearance test
2. Creatinine clearance test
3. Glucose tolerance test (G.T.T.)
4. Assay of enzymes :
   - Serum Amylase
   - Serum Acid and Alkaline Phosphatase
   - SGOT & SGPT
5. Stone analysis
6. Lipidogram
7. Clinical Posting – Posting in Clinical Biochemistry Lab.

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Syllabus B.Sc. (APB) Third Year

PAPER – IV : Psychology & Education

Theory (100 hours)

1. Adolescence : Characteristics of adolescence, Socio-Psychological development fo adolescent and young adults, crises of adolescent
2. Cognitive development among youth
3. Problems of Indian youth in different areas such as education, home life, social life, future, money, religion and health.
4. Aggression and violence amongst Indian youth.
5. Drug use and abuse amongst students, its causes and treatment and rehabilitation of drug addicts
6. Guidance evaluation of evaluation of knowledge

Books recommended

1. The Psychology of Adolescence by Jersild, AT, Brook, JS and Brook, DW, Macmillan Publishing Company, New York.
2. Hand book of Developmental Psychology by Wolman, BB. Prentice Hall, Englewood Cliffs, N.U.
3. The Growth of Logical Thinking from Childhood to Adolescence by Inhelder, B and Piaget, J. Basic Books, New York.
4. Drug Abuse in India – A Report (1977) Ministry of Health & Family Welfare, Govt. Of India.
5. Guidance and Counselling in Colleges and Universities by Kochhar S.K. Sterling Publishers, New Delhi.
6. Counselling Technology by Rao, SN. Tata McGraw, New Delhi.

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