DPU

Dr. D. Y. Patil Vidyapeeth, Pune

(Deemed University)

(Re-accredited by **NAAC** with a **CGPA** of **3.62** on a four point scale at **'A' Grade)**

(An ISO 9001 : 2008 Certified University)

INFORMATION BROCHURE & APPLICATION FORM 2016

All India Biotechnology Common Entrance Test 2016 (AIBTCET - 2016)
for Admissions to

B. Tech. Biotechnology
B. Tech. Medical Biotechnology
M. Tech. (Integrated) Biotechnology

Programme

राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद

विश्वविद्यालय अनुदान आयोग का स्वायत्त संस्थान

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

An Autonomous Institution of the University Grants Commission

Certificate of Accreditation

The Executive Committee of the
National Assessment and Accreditation Council
on the recommendation of the duly appointed
Peer Team is pleased to declare the
Dr. D. Y. Patil Vidyapeeth
(Deemed to be University u/s 3 of the UGC Act 1956)
Pimpri, Pune, Maharashtra as
Accredited
with CGPA of 3.62 on four point scale
at A grade
valid up to March 02, 2020

Date : March 03, 2015

Director

EC(SC)/05/RAR/053

Chancellor's Message

Dear Students,

It is a matter of great pleasure to communicate with you through this brochure. I believe that education is much more than merely empowerment in terms of knowledge and skills. It offers a spirit of intellectual inquiry, cultivating power of thought and imagination. It also envisages inculcation of values and development of a firmness of mind and a zeal to offer one's best to the world.

In an attempt to meet these objectives, the Vidyapeeth offers a wide range of professional programmes. In each of these programmes, we ensure high quality of education, pursuit of knowledge and creation of new ideas. As a result of this, recently the Vidyapeeth has been **re-accredited** by **NAAC** with a **CGPA** of **3.62** on a four point scale at **'A' Grade**. Through dynamic, relevant and quality education, students are empowered to look forward to the future with confidence. “No wonder, therefore, that there is always a rush for admission to the various courses of the Vidyapeeth.”

The present common entrance test covers six cutting-edge academic programmes, leading to degrees in Bachelors & Master (Integrated) Biotechnology. All these are high quality research-oriented programmes and will lead you to satisfying careers in emerging areas of technology.

These programmes are run in Dr. D. Y. Patil Biotechnology and Bioinformatics Institute of Dr. D. Y. Patil Vidyapeeth, Pune. In this centre of learning, you get the state-of-the-art infrastructure and facilities as well as competent and devoted faculty. The inspiring ambience in this institute will motivate you to do your best and at the end of the programme, you will emerge as an accomplished professional, ready to contribute your best to the society and the country.

I wish you the best of luck for the All India Biotechnology Common Entrance Test for admission to the professional course of your choice at the Institute.

Dr. P. D. Patil
Chancellor

Vice Chairperson's Message

Dear Students,

It is my privilege to share my views through this brochure, the best media to connect the young minds of the Nation. As aptly said by Robert Maynard Hutchins, "The objective of education is to prepare the young to educate themselves throughout their lives".

In keeping with its mission of academic excellence, Dr. D. Y. Patil Vidyapeeth, Pune, (DPU) is always continuing its inexorable developmental activities, in all fronts, in a bid to create a world class University. This is reflected by the consistent expansion of infrastructure, faculty, research contributions and national and international linkages & collaborative initiatives, signaling out globally that DPU is focused in its activities with its thrust being on developmental activities.

Visualizing an enlightened, cultured, and economically vibrant India, developed through education in diverse disciplines, we at DPU always keep in mind the commitment to contribute towards the growth of our nation, the purpose of our Vidyapeeth and also our dream to make DPU a global hub for academic excellence in the field of higher education.

Mrs. Bhagyashree P. Patil
Vice Chairperson

Vice Chancellor's Message

Dear Students,

I am extremely happy to interact with you through this brochure. Dr. D. Y. Patil Vidyapeeth has been recognized as an institution that has been delivering a very high quality education with emphasis on interactive teaching methods and focused research in diverse fields. DPU is known for Academic Heritage, World Class Faculty, State-of-the Art Infrastructure, International Teaching Pedagogies, Excellent Learning Environment, Dynamic Research Culture and Emphasis on Overall Personality Development. Our curriculum innovations, include enhancement of integrated modules, case based & rapid cycle learning methods, inclusion of patient safety & health care quality concepts at all levels, to name a few.

At our colleges, we provide opportunities for involvement in innovative research projects and life enhancing community service thriving on our campuses. We believe that complete education is what makes a student self-educated. To ensure this, greater emphasis is given on what student have learned and not necessarily what they were taught.

What we have achieved so far is definitely commendable. But, I believe that there is still scope for us to become better and to reach higher levels of academic excellence. I have no doubt that we will be able to achieve these objectives with cooperation from our faculties of various institutions, which include experienced, knowledgeable and caring mentors.

I assure to all Parents & Students that we will continue to strive hard to provide quality education to the youth and live through the processes and systems that are of global standards.

Lastly, I congratulate you for having chosen this college to pursue and attain your future dreams and professional objectives in the area of health sciences and wish to extend my heartiest welcome on behalf of the entire Vidyapeeth fraternity. I wish you All the Best for a successful performance at the AICET-2016.

Dr. P. N. Razdan
Vice Chancellor

Executive Director's Message

Dear Students,

It is a great pleasure to express my views for incoming prospective students wishing to embark a career in Biotechnology at Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Tathwade, Pune.

I am happy to endorse that Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Pune, is aware of the basic requirements for the successful running of a biotechnology center. As a result the newly constructed building hosts a 90,000 sq. feet campus which is a home to hi-tech laboratories with modern instruments for teaching and research work, a library of thousands number of books, a technically advance computer laboratory, a center of excellence as microbial diversity department, in-house canteen and separate hostel accommodation for male and female students & entire WAN network with speed up to 45 mbps.

In addition to modern infra-structure, the team at DPU constitutes of highly qualified and competent faculty with national and international experience in teaching and research. The center provides an ideal milieu for inter-disciplinary and collaborative research. The research activities of faculty members are well funded through extra-mural research funding from government agencies such as CSIR, DBT, DST, etc. The institution has maintained a very high standard of academic excellence and has an inspiring ambience that promotes full utilization of an individual capacity and capability in the field of biotechnology and bioinformatics education. The institute host a number of fully equipped laboratories for performing modern techniques such as molecular biology, animal tissue culture, plant tissue culture laboratory and bioinformatics laboratory state - of - art facilities to support quality learning and advanced research.

I wish good luck to aspiring candidate for their All India Entrance Examination and shall be looking forward to seeing you enroll as a part of DPU family, in future.

Dr. Somnath Patil
Executive Director, DYPBBI

Sixth Convocation of the Vidyapeeth - 26th June 2015

Gold Medal Awardees with Chief Guest
Shri. Pranab Mukherjee, President of India

Felicitation of Chief Guest Shri. Pranab Mukherjee
President of India

Felicitation of Shri. CH Vidyasagar Rao
Governor of Maharashtra

Felicitation of Dr. Raghunath Mashelkar
National Research Professor

Ph.D. Biotechnology (Faculty of Biotechnology & Bioinformatics)
Awarded to Bhalchandra Pandurang Mirlekar
by the hands of Shri. CH Vidyasagar Rao
Governor of Maharashtra

Gold Medal Awarded to Mr. Deorukhakar Hemant Sandesh
B.Tech. Biotechnology
by the hands of Shri. Pranab Mukherjee, President of India

Location

Pune - From Cultural Capital to IT Hub is also known as Oxford of the East

Pune having more than a hundred educational institutes, nine Universities, with students from all over the world studying at the colleges of the Nine Universities, have acquired a reputation of being known as "The Oxford of the East". About 25,000 foreign students from over 99 countries are studying at Pune.

Pune is a city of great historical importance. It flourished during the rule of Shivaji, the founder of the great Maratha dynasty in India, and grew during the Peshwa rule. It is situated at the height of 575 meters above the sea level, on the Deccan plateau in the Sahyadri ranges.

SALIENT FEATURES	
Altitude	575 m
Area	146 sq. km.
Population	6.5 Million (approx)
Language	Marathi, English, Hindi

Climate	Max. Temp (C)	Min. Temp (C)
Summer	38	20
Winter	25	8
Rain	Moderate 75 cm. p.a.	

Pune is a green and picturesque city surrounded by verdant hills. It has a large number of reputed educational and research institutes, such as University of Pune, Deccan College, College of Military Engineering (CME), Armed Forces Medical College (AFMC), Bhandarkar Oriental Research Institute, National Chemical Laboratory (NCL), National Defence Academy (NDA) National Center for Cell science (NCCS), National Institute of Virology (NIV), National AIDS Research Institute (NARI) and Information Technology park at Hinjewadi, etc. Dr. D. Y. Patil Vidyapeeth, Pune and its constituent colleges / institutes are located in Pimpri Chinchwad area in Pune.

Dr. D. Y. Patil Vidyapeeth, Pune is located at a distance of 13 km. from Pune Railway Station and from the Airport. Pune is well connected not only to Mumbai but also with the entire India through rail, air and by roads. It also has an International Airport.

About Vidyapeeth

Vidyapeeth has been Re-accredited by NAAC with a CGPA of 3.62 on a four point scale at 'A' grade.
Vidyapeeth has also obtained ISO 9001 : 2008 Certification.

Vision

To help build an enlightened, culturally and economically vibrant India, developed through education in diverse disciplines.

Mission

To contribute to the socio-economic and ethical development of the nation, by providing high quality education through institutions that have dedicated faculty and state-of-the-art infrastructure, and are capable of developing competent professionals and liberal-minded citizens.

Vision 2025

To develop a knowledge centre which will be recognised for its academic pursue not only in India but also globally

Objectives

The principal objectives of the Vidyapeeth are to :

- Establish institutions for learning and research.
- Raise academic standards in the constituent units of the Vidyapeeth.
- Develop evaluation methods that rest students objectively.
- Bring about capacity development of teachers.
- Encourage both teachers and students to undertake research.
- Enter into collaboration with higher educational institutions.
- Undertake extension activities for the development of the community.
- Develop and enter into collaborative programmes with Indian and foreign Universities and other academic institutions, scientific organizations and other agencies.
- Carry out instructions and training, distinguishable from programmes of ordinary nature, for making distinctive contributions in the areas of specializations.
- Provide for special training or coaching for competitive examinations, for recruitment to the Public Services, Public Undertakings and other competitive employment opportunities
- Develop students personalities as informed and objective critics, identify and cultivate their talents, train right kind of leadership, develop right kind of attitudes, interests and values.

Establishment

Dr. D. Y. Patil Vidyapeeth, Pune was granted Deemed-to-be University status under section 3 of the University Grants Commission Act 1956 by the Government of India, Ministry of Human Resource Development, vide their Notification No. F.9-39/2001 - U.3 dated 11/01/2003 on the recommendation of the University Grants Commission, New Delhi.

This status was accorded in recognition of high quality of education imparted through the state-of-the-art infrastructure and dedicated faculty of the medical college and ascertaining the potential of the institute for excellence.

Membership National and International Bodies

- Association of Indian Universities (AIU), New Delhi.
- Association of Commonwealth Universities (ACU), UK.
- International Association of University Presidents (IAUP), US.
- All India Management Association (AIMA), New Delhi
- Institutional Membership of the Current Science Association, Bangalore

Constituent Colleges and Institutes :

- Dr. D. Y. Patil Medical College, Hospital & Research Centre, Pimpri, Pune.
- Dr. D. Y. Patil Dental College & Hospital, Pimpri, Pune.
- Dr. D. Y. Patil College of Physiotherapy, Pimpri, Pune.
- Dr. D. Y. Patil College of Nursing, Pimpri, Pune.
- Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Tathawade, Pune.
- Global Business School & Research Centre, Tathwade, Pune.
- Dr. D. Y. Patil Institute of Optometry and Visual Sciences, Pimpri, Pune.

From the Director's Desk

Dear Students,

Modern Biotechnology is an area of activity with actual as well as potential impact on every sphere of human welfare; from food technology, environmental protection, medical diagnosis and treatment, to national security. The field of biotechnology has, of late, pervaded and percolated every dimension of human activity, thus leading to employment generation, production and productivity, trade, economics and economy, health/well-being, and the quality of human life, throughout the world. Bioinformatics, on the other hand, is the application of computer technology to the management of biological information. It combines computer science with biology to gather, store, analyse and integrate biological and genetic information which can then be applied to drug discovery and development. Truly, Bioinformatics is an indispensable ally of researchers in every area of biological research.

The biotechnology industry comprises of various segments: Blue (aquatic), Green (agricultural), Red (medical) and White (industrial) biotechnology. While Bio-pharma deals with the production of vaccines, therapeutics and diagnostics, Agri-biotech deals with plant tissue culture, transgenic crops, bio-pesticides, and bio-fertilizers. Bioinformatics uses biological data and speeds up development of new products. Bio-industrial sector deals with bio-products manufacturing which are used in detergent, textile, food, leather, paper and pharmaceutical industry. Dr. DY Patil Biotechnology & Bioinformatics Institute strives to enable its students to be competent and specialist biotechnologist of the future, in his/her chosen area of interest, in an intellectually and scientifically open ambience.

Our institute is located in the suburbs of the Rajiv Gandhi Biotech Park near Hinjewadi, Pune City, also proudly known as 'Punya-Nagari' is the ninth largest metropolis in India, the second largest in the state of Maharashtra after Mumbai, and the largest city in the Western Ghats. Pune is known for its educational facilities and relative prosperity as one of the largest city in India and as a result of its many colleges and universities. It is emerging as a prominent location for biotechnology, information technology and manufacturing companies to expand.

I wish good luck to the students for their forth coming all India Entrance Examination and shall be looking forward to their admission in our Institute.

Dr. Ashima Bhan
Acting Director

Biotechnology & Bioinformatics Institute Infrastructure

Main Building

Reception

Interior

Marigold Hostel

About The Institute

The Institute

Dr. D. Y. Patil Biotechnology & Bioinformatics Institute, Tathawade, Pune -33 is established as one of the constituent unit of Dr. D. Y. Patil Vidyapeeth (Deemed University) Pune. The Institute is located at Survey No. 87/88, Tathawade Pune -33. This institute is led by eminent Biotechnologists, Molecular Biologists, Biochemists, Industrial Microbiologists, Plant & Animal Biotechnologists & Bioinformaticians. In addition, eminent visiting faculties from Industrial & Academic background are invited for their valuable expertise in the specialized topics covering Biotechnology & Bioinformatics

Infrastructure

Institute is having a separate building with sixty five thousand sq. ft. area.

The Institute has developed state-of-the-art lecture rooms equipped with LCD and overhead projectors, Public address (PA) system etc. It has a well equipped library with titles from foreign and Indian authors. The laboratory, facility with the equipments required to meet the aims and objectives of the Institute. It has a well equipped computer laboratory with ninety five personal computers with LAN connection and 24X7 high speed internet facilities through which students can access scientific literature, lectures by faculty, industry news which would help them to create general awareness in the discipline.

It is also possible to access Bioinformatics databases and software, public domain software for molecular graphics and informatics in addition to in house software and application software from commercial vendors (e.g. SYSTAT for statistical analysis, Bioinformatics packages:- V life, Flexy and HYPERCHEM). The institute has 21 laboratories for: Biochemistry, Microbiology, Industrial Biotechnology, Animal & Plant Tissue Culture, Molecular Biology, Instrument laboratory and two computer laboratories. Wet laboratories are equipped with spectrophotometers (UV-VIS, double beam), electronic balances, high speed cooling centrifuge, deep fridge-20^{0}C BOD incubators, HPLC, laminar air flows, ELISA reader, Gel Doc System, Fermenters, PCR machines etc. Further, the Institution has ambitious plans for developing one of the best Research and Development center for contract research program in Pune.

Hostel Accommodation:

On campus Girl's & Boy's Hostel facility are available on payment basis subject to availability. It is a well built hostel of 32,256 Sq.ft. area having Mess facilities on payment basis. The rooms are well furnished along with the amenities like Internet facility, Telephone facility, Doctor on Call, Hot water facility, Reading Room & Central TV room are also available.

Research

Dr. D. Y. Patil Biotechnology & Bioinformatics Institute has established research in related to Biotechnology & Bioinformatics area in a short span of time. The Institute has received research funding from National & International agencies like Department of Science & Technology (DST), Govt. of India & Swedish International Development Corporation Agency (SIDA), Sweden. The faculty publishes papers in National & International peer reviewed journals & presents their research with their students at National & International conferences. The Institute has published 99 research papers, 9 book chapters & 150 research abstracts since 2009. Nearly 20% students pursue higher studies in reputed national & international universities giving strong alumni to the Institute under bilateral exchange program our students are deputed to University of Skövde, Sweden for a duration of 1/2 semester based on their over all academic performance. Further details are available on www.biotech.dpu.edu.in

The Programmes

B. TECH. BIOTECHNOLOGY, B. TECH. MEDICAL BIOTECHNOLOGY & M. TECH. (INTEGRATED) BIOTECHNOLOGY

The B. Tech Biotechnology, course has eight semesters & M. Tech (Integrated) Biotechnology course has ten semesters. It covers **basic subjects as:** Physics, Chemistry, Basic Biology, Biomathematics & Biostatistics, Microbiology, Biochemistry, Cell Biology, Engineering Courses, Plant & Mammalian Physiology, Molecular Biology, Genetics & Immunology. **Advance Biotechnology subjects as:** Genetics Engineering, Pharmacology & Toxicology, Biopharmaceuticals, Fermentation Technology, r-DNA Technology, Food, Environmental Biotechnology, Industrial Biotechnology, Bioprocess Engineering, Animal & Plant Tissue Culture, Quality Control Management, **Computer Courses such as :** Introduction to Computers & C Programming, Data Structures & Algorithms and few **Bioinformatics courses as :** Functional Bioinformatics, Structural Bioinformatics, Drug Designing, Protein Modeling, Genomics, Proteomics, etc. The B. Tech Medical Biotechnology course has eight semesters. It covers **basic sciences subjects as:** Physics, Cell Biology, Mathematics, and Bimolecular & Organic Chemistry. **Medical Related Subjects as:** Medical Biochemistry, Microbiology and Virology, Human Anatomy & Physiology, Pharmacology & Toxicology, Cancer Biology, Human Genetics, Biopharmaceuticals, Epidemiology and Developmental Biology. **Medical Technology Related Subjects as:** Analytical Techniques, Molecular Biology, Immunology, Genetics Engineering, Animal Cell Culture, Bioprocess Engineering, Tissue Engineering & Transplantation, Forensic Science, Nano medicine, Biosensors & artificial organs. **Engineering Subjects as:** Electronic and Instrumentation, Introduction to Computers & Computer Application, Biomedical Instrumentation and Biomedical devices. **Medical Informatics Related subjects as:** Bioinformatics, Molecular Modeling and Drug Designing, Genomics, Transcriptomics and Proteomics, Metabolic Engineering and System Biology. **Humanity Related Courses as:** Communication Skills, Environmental Sciences, Biosafety, Bioethics & IPR and Hospital Management. **Elective Courses as:** Group 1: Clinical Research, Group 2: Molecular Medicine and Cancer Research, Group 3. Vaccine and Drug Development, Group 4. Advanced Medicine etc., The students will also study subjects like: Communications Skills, Technical Writing, and Scope of Biotechnology in Business, Bioethics, Biosafety, IPR etc., for development of his/her personality and make him/her ready for the industry and research. The integrated M. Tech course in Biotechnology trains students essentially for Research & Development in Biotech Industry. For this the last semester of B. Tech courses and last two semesters of M. Tech course are set aside for industrial training and / or research training.

Biotechnology and the opportunities it offers:

Biotechnology combines genetics, biochemistry, microbiology, immunology, fermentation technology, bioprocess engineering, tissue culture technology, molecular biology and recombinant DNA technology.

Biotechnology has applications in the production of medical and veterinary products, chemicals, food, drugs and pharmaceuticals, diagnostics, blood products, artificial organs, neutraciticals, etc. and in the fields of chemical engineering, energy, pollution control, environment protection and waste management. Industrial units in these fields need personnel skilled and trained in biotechnology.

Medical Biotechnology and the opportunities, it offers:

Medical Biotechnology combines genetics, biochemistry, microbiology, immunology, bioprocess engineering, tissue culture technology, molecular biology and recombinant DNA technology that is required to develop new drugs, diagnostic kits, alternate therapeutics, understanding disease and its pathways.

Medical Biotechnology has applications in the production of medical products, drugs, vaccines, diagnostics kits, pharmaceuticals, blood products, artificial organs, neutraciticals, etc. and in the fields of clinical research, drug discovery, epidemiology, cancer and AIDS research, regenerative medicine, forensic science, gene therapy, genetic counseling, eugenics,

Skills you will acquire after completing Biotechnology Programmes

- Basic Cell Biology and Microbiology Techniques
- Bio-analytical Techniques
- Molecular Biology Techniques
- Tissue Culture (Animal and Plant) Techniques
- Immunology and Biopharmaceutical Techniques.
- Effective communication, computer basic management & entrepreneurship skills.
- Fermentation Technology
- Food Biotechnology
- Ecology & Environment
- Cancer Research
- Nano Biotechnology
- Clinical research
- Bioprocess Technology
- Forensic Research

Eligibility Criteria

Eligibility Criteria for appearing at Entrance Test

a) The candidate should be an Indian National.
b) Minimum age: 17 years on or before 31st December 2016 (having born before 1st January 2000)
c) The candidate must have either appeared at Higher Secondary Certificate (HSC / Std. XII) examination of any board in India, with Physics, Chemistry and Biology or Life Sciences related (and desirably with Mathematics) or, if the result of the exam. has been declared, he / she must have passed the same examination with minimum 45% marks in Physics, Chemistry and Biology taken together (40% for the Reserve Category candidates).

Eligibility Criteria for Admission

a) Minimum age: 17 years on or before 31st December 2016 (having born before 1st January 2000)
b) The candidate must have passed Higher Secondary Certificate (HSC / Std. XII) examination of any board in India or abroad, with minimum 45% marks in Physics, Chemistry and Biology, Biological Science / life science related subject, and/or Mathematics taken together (40% for the backward class candidates) (and desirably with Mathematics) OR equivalent qualification from abroad.

Eligibility for NRI / PIO / FN

A candidate in any of these categories shall have completed 17 years of age on or before 31st December 2016 (having born before 1st January 2000). He/she must have Physics, Chemistry, Biology Life Sciences related and English (and desirably Mathematics) at the CBSE, ISC, HSC or an equivalent examination. In the case of a student from any school that follows the American system of education, the candidate must have studied Physics, Chemistry and Biology (and desirably Mathematics) at AP' (Advanced Placement) level and must have minimum 'C' grade in these subjects.

In the case of students passing Cambridge International Examination (CIE) the candidate should have passed Physics, Chemistry and Biology at "Advanced" level along with English at "Advanced Subsidiary" (AS) level.

Subjects and Syllabi for the Entrance Test

The Entrance Test will consist of 100 objective types multiple choice questions (MCQs) in the subjects of Physics, Chemistry and Biology (Botany and Zoology) carrying 100 marks (25 marks each subject). The recommended syllabus for the test has been given in this brochure as Annexure I.

Poly House and Laboratories

Library (Reading hall) and Bioinformatics Lab

Intake Details

1. Duration and Intake Capacity (No. of Seats):

Courses	B.Tech. Biotechnology	B.Tech. Medical Biotechnology	M.Tech. (Integrated) Biotechnology
Duration (Years)	4	4	5
No. of Seats	60	30	30

2. Distribution of Seats:

Courses	General Category Seats 85%	NRI/PIO/FN Category Seats 15%
B.Tech. Biotechnology	51	9
B.Tech. Medical Biotechnology	25	5
M.Tech. (Integrated) Biotechnology	25	5
(NRI : Non Resident Indian; PIO : Person of Indian Origin; FN : Foreign National)		

Reservation will be as per directive of the Government of India, for Universities established under Section 3 of UGC Act 1956 by Govt. of India, through the University Grants Commission as and when received.

General Category:
Admissions to this category shall be made on the basis of the inter se merit of the candidates, who have qualified at the AIBTCET-2016.

NRI/PIO/FN Category:
A candidate belonging to this category are not required to appear at the AIBTCET-16. However, he/she shall submit a separate application, in the prescribed form, available in the Vidyapeeth office and on the Vidyapeeth website. A committee, appointed by the competent authority for the purpose shall admit candidates on the basis of their inter se merit. The candidate will be required to pay a processing fee of US $ 200.

In case any seat earmarked for NRI/PIO/FN is not filled in by the candidate(s) of any of these subcategories, the Management shall fill in such vacant seat(s) from the candidate(s) who has / have cleared the AIBTCET-16 and has / have applied for the seat separately in the prescribed form available in the Vidyapeeth office and website.

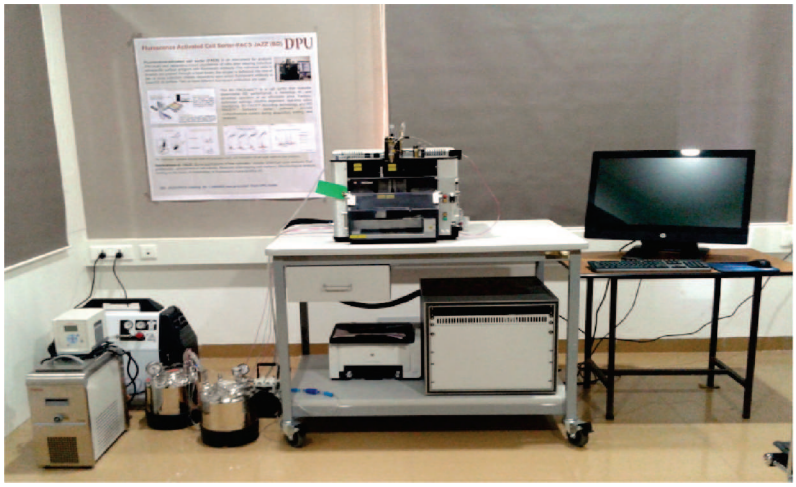
NRIs, PIOs and FNs:

An NRI is a person who is not a resident or who is not ordinarily resident. A person is treated as not ordinarily resident (i) if he/she has been resident in India for less than 182 days in the year preceding the date of application; or (ii) If he/she has been in India for less than 365 days during the four years immediately preceding the date of application.

A PIO is a person having foreign citizenship (except Pakistan and Bangladesh) within NRI status, but who holds a foreign passport at the time of sending application or at the time of consideration of admission and during the period of his study and whose one / both parents or anyone/both grand parents is (or was) / are (or were) citizen(s) of India by virtue of the provisions of the Constitution of India or Section 2(b) of Citizenship Act 1955 (Act No. 57 of 1955).

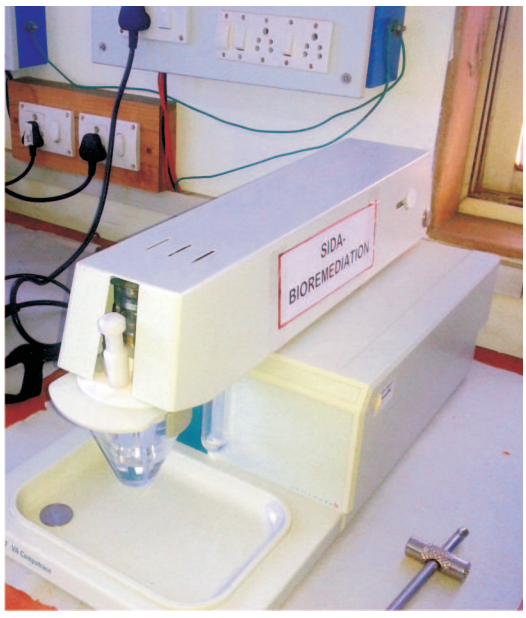
An FN is a person having citizenship of a foreign country (any country other than India) and not having the status NRI and / or PIO.

Important:
Under the NRI, PIO and FN categories, only those students who have studied and passed the qualifying examination from schools and/or colleges located in foreign countries (all countries other than India) shall be considered. This will include the students studying in schools and colleges situated in the foreign countries, even if the concerned school/college is affiliated to any Board of Secondary Education or a University in India. However, wards of NRIs, PIOs or FNs, who are studying for the qualifying examination in schools located in India, are excluded.



Central Research Facility - Flow Cytometer

Total Organic Carbon Analyzer



Heavy Metal Analyzer

Biotechnology & Bioinformatics Infrastructure

Research Facilities

Plant Tissue Culture Laboratory

Modern Equipment

Microbial Diversity Research Laboratory

Library - Book Stacking Area

Classroom

Technically Advanced Computer Laboratory

FACULTY DETAILS

S.N.	Name of the Staff	Qualification	Designation	Teaching/Research Experience after PG
1	Dr. Ashima Bhan	M.Sc., M.Phil. (Zoology), Ph.D (Life Science)	Director -in-Charge	23Years
2	Dr. G. D. Tondon	M.Sc, Ph.D (Microbiology)	Professor	45 Years
3	Dr. Rajendra TK	M.Sc, Ph.D (Molecular Genetics, Cell & Devlopmental Biology)	Professor	23 Years
4	Dr. Neelu N. Nawani	M.Sc., Ph.D. (Microbiology)	Associate Professor	20 Years
5	Dr. Minal Wani	M.Sc, Ph. D. (Plant Physiology)	Associate Professor	21 Years
6	Dr. Feroz Khan	M. Sc. Ph.D. (Biotechnology)	Associate Professor	16 Years
7	Dr. Girish Bhopale	M.Sc., Ph.D. (Life Science)	Associate Professor	42 Years
8	Dr. Manisha Deshpande	M.Sc., Ph.D (Biotechnology)	Associate Professor	20 Years
9	Dr. Soumya Basu	M.Sc. (Microbiology) Ph.D. (Life Science)	Assistant Professor	13 Years
10	Dr. Rajesh Kumar Gupta	M.Sc. , Ph.D. (Life Science)	Assistant Professor	16 Year
11	Dr. K. V. Swamy	M.Sc., Ph.D. (Biochemistry)	Assistant Professor	13 Years
12	Dr. Amit Ranjan	M.Sc. (Cancer, Invasion & Metastasis), Ph.D. (Molecular Biology & Biotechnology)	Assistant Professor	9 Years
13	Dr. Manjusha Dake	M.Sc. Ph.D., (Biochemistry)	Assistant Professor	18 Years
14	Dr. Supriya Kore	M.Sc., Ph.D. (Zoology)	Assistant Professor	20 Years
15	Dr. Rachana Pandey	M.Sc., Ph.D. (Biotechnology)	Assistant Professor	18 Years
16	Dr. Vrushali Gadekar	M.Sc. Ph.D.	Assistant Professor	18 Years
17	Dr. Nilesh Sharma	M.Sc. Ph.D., Molecular Biology	Assistant Professor	13 Years
18	Dr. Shuchi Nagar	M.Sc. Ph.D. Bioinformatics Computer Aided Drug Designing	Assistant Professor	11 Years
19	Mr. Amol Salagare	M.Sc Microbiology	Assistant Professor	9 Years
20	Ms. Arti Deshmukh	M.Sc. (Microbiology), SET, B Ed.	Assistant Professor	15 Years
21	Mrs. Ashwini Puntambekar	M.Sc. Biotechnology, M.Phil.(Biotech.)	Assistant Professor	15 Years
22	Mrs. Ashlesha Sangmuly	M.Sc Biotechnology	Assistant Professor	9 Years
23	Mrs. Jyoti Bidwai	M.Sc Biotechnology	Assistant Professor	10 Years
24	Dr. Snehal Pande	M.Sc. Biotechnology, MBA, Ph.D.	Assistant Professor	9 Years
25	Ms. Priyanka Bhopale	B.E. (Computer Science)	Assistant Professor	8 Years
26	Mrs. Manisha Junnarkar	M.Sc. Biotechnology	Assistant Professor	9 Years
27	Ms. Sheetal Pandit	M.Sc. Bioinformatics	Assistant Professor	8 Years

Category wise Salary Pattern for the Academic Positions

S.N.	Designation	Pay Scale
1	Assistant Professor	15600 - 39100 AGP - 6000
2	Associate Professor	15600 - 39100 AGP - 8000
3	Professor	37400 - 67000 AGP - 10000

Calendar of Events for

B. Tech Biotechnology /B. Tech. Medical Biotechnology / M. Tech. (Integrated) Biotechnology - (AIBTCET- 2016)

1	Form Fee	Rs. 500/- (Add Rs. 100/-, if required by post) DD Favoring "The Registrar, Dr. D. Y. Patil Vidyapeeth, Pune", Payable at Pune.
2	Last date for submitting the application form to - Dr. D. Y. Patil Vidyapeeth, Pune for All India Biotechnology Common Entrance Test - 2016 (AIBTCET-16)	1) Without late fee upto : Wednesday, 15 / 06 /2016 until 5.00 pm (Test Fee Rs. 1000/-) 2) Without late fees : Downloaded form should accompany a DD of Rs.1,600/- 3) With late fees upto : Wednesday, 22 / 06 / 2016 until 5.00 pm (Test Fee Rs. 1250/-) 4) With late fee : Downloaded form should accompany a DD of Rs.1850 /-
3	Centre for the AIBTCET - 2016	**Ahmedabad, Chandigarh, Mumbai, New Delhi, Pune**
4	Dispatch of admit cards to candidates who are considered provisionally eligible for AIBTCET - 16	Two weeks before the day of AIBTCET-2016
5	Issue of duplicate admit cards. Duplicate admit cards will be issued to the candidates who have not received admit cards.	These will available at AIBTCET Centres, between 11.00 am and 2.00 pm on 25/06/2016 or between 9.30 am and 10.30 am on the day of AIBTCET-16
6	**Day, Date & Time of AIBTCET-16**	**Sunday, 26/06/2016** **From 11.00 am to 12.30 pm**
7	Declaration of results	**Saturday, 02/07/2016**
8	Date of counseling for admission 1) B.Tech. (Biotechnology) 2) B. Tech. Medical Biotechnology 3) M. Tech. (Integrated) Biotechnology	**Tuesday, 12/07/2016**
9	Venue of admission sessions	Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Tathawade, Pune.
10	College to open on	**Monday, 01 / 08 / 2016**
11	Fee Structure B.Tech. (Biotechnology) B.Tech. Medical Biotechnology M. Tech. (Integrated) Biotechnology	General : Rs. 1,40,000/- NRI/PIO/FN Category : US $ 7200

Fee Structure

Particulars	General Category	NRI/PIO/FN Category
Annual Fees	Rs. 1,40,000/-	US $ 7200

Note: **1. Annual Fee includes Tuition Fee, Development Fee and Other Fee**

2. All the fees are receivable only by Demand Draft

The Annual fee shall be increased by 3% each year

The Annual Fees is to be paid by a Demand Draft (DD) drawn in favor of **"Director, Dr. D. Y. Patil Biotechnology and Bioinformatics Institute"**, payable at Pune by the student at the time of counseling and issue of admission letter.

VIDYAPEETH ELIGIBILITY & REGISTRATION FEE (ONE-TIME FEE):

Ten Percent (10%) of the Annual Fee, payable for the first year only, shall be paid by the student separately at the time of filling in the Eligibility Application, as Vidyapeeth Eligibility & Registration Fee. This fee shall be paid by a Demand Draft (DD) Drawn in favor of **"Registrar, Dr. D. Y. Patil Vidyapeeth"** payable at Pune.

(Note: The Vidyapeeth Eligibility & Registration Fee is non-refundable)

HOSTEL FEES FOR ACADEMIC YEAR 2016-17

The hostel fees is to be paid by the student at the time of counseling and on-the-spot admission session by a Demand Draft (DD) drawn in favor of **"Dr. D. Y. Patil Vidyapeeth Society"**, payable at Pune.

RAGGING

Ragging in any form is a punishable offence in accordance with the "UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009", and committing this act of indiscipline shall result in punishment under the provisions of any penal law for the time being in force. On admission, candidates will be provided with detailed guidelines related to Ragging.

As per the recent UGC Regulations, the affidavits to be filed by the Student and their parent about the anti-ragging regulations of UGC, these affidavits need not be on stamp paper nor need to be registered. On the Contrary they should be submitted by the admitted students by submitting these affidavits on-line by following WEB Site : http://antiragging.in/site/affidavits_registration_form. aspx

(This link is also available on DPU website)

VIDYAPEETH EXAMINATION FEES

In addition to the above fees the student shall pay the Vidyapeeth Examination Fee as prescribed by the Vidyapeeth from time to time. Other conditions and formalities shall be as per the Rules of the Vidyapeeth.

RULES FOR CANCELLATION OF AN ADMISSION AND REFUND OF FEES

- Admission to the course can be cancelled at the request of the student, on submission of an application, within time.
- The Student applying for cancellation of the admission on or before the last date of admission, he will be entitled to get refund of fees except administrative charges, provided seat is filled.

Instructions To Candidates

Candidates are advised

1. To read the instructions for filling up the application form given in the brochure.
2. To affix photographs on the application form, Admit Card & Letter of Authorization (for Representation during selection process) taken from the same negative.
3. To verify that the application form is signed by the candidate, candidate's parent/guardian and that the photograph is duly attested by the Head of the Institution along with the official seal, before submitting.
4. To preserve the Fee Receipt and Admit Card safely and bring the same to the Test hall and produce it on demand.
5. To use only **black ballpoint pen** for marking responses (answers) and for all other entries.
6. To note that issue of Admit Card is just a provision for appearing in AIBTCET-16 and does not imply that the candidate is eligible for admission.
7. To contact the Registrar of the Vidyapeeth for duplicate Admit Card, in case the Admit Card is NOT RECEIVED a week before the test.
8. To obtain duplicate Admit Card from the center in-charge, on the previous day of the test, in case of loss of Admit Card.
9. To occupy the seat in the test hall at least 30 minutes before the commencement of the Test, and in any case, not after 11.30 am.
10. Not to bring calculators, calculating devices like Cellular (mobile) phone / pager, etc. in the test hall.
11. To enter the AIBTCET-16 Seat Number carefully on the answer sheet.
12. Not to remove any page(s) from the Test Booklet. If any page(s) is/are found missing from his/her Test Booklet, he/she will be proceeded against and shall be liable for criminal action.
13. Not to leave the test hall till the completion of Test, and handing over the Answer Sheet and Test Booklet to the invigilator.

Admission Procedure

3.1 General

(I) Admissions to all these courses shall be by an All India Biotechnology Common Entrance Text (AIBTCET-16) conducted by the Vidyapeeth. The test will be of 1.30 hrs duration and will have 100 objectives multiple choice questions (MCQs) of 1 mark each. The recommended syllabus for this test is appended in this brochure as Annexure - I.

(ii) It shall be the responsibility of the candidate to ascertain the result of the AIBTCET-16.

(iii) If selected, the candidate shall remain present for on-the-spot admission, as per the schedule given in Important Information at a glance. The admission sessions will be conducted at the office of the Vidyapeeth. Failure to report for admission on the scheduled date and time shall result in cancellation of the claim of the candidate to the seat.

Only the candidate and one of his/her parents/guardians shall be allowed into the admission hall. The candidates shall be called in the order of their ranking in the merit list.

(iv) Appearance at the AIBTCET-16 and inclusion of name in the merit list does not necessarily mean that he/she shall get admission to a course. His/Her admission to a course shall depend upon the availability of seats when his turn comes.

(v) At the time of reporting for admission, the candidate shall produce the documents (original and two sets of photo copies) as listed in 'List of Documents' on the Vidyapeeth website.

If the candidate is admitted to a course, these documents shall be retained by the Vidyapeeth till he/she completes the course. If the candidate fails to produce any of the documents listed in 'List of Documents' on the Vidyapeeth website, his/her claim for admission shall stand forfeited.

(vi) The selected candidate is required to pay the entire amount of fees shown in the Fee Structure on the day of counseling and on-the-spot admission itself. In case the candidate fails to pay the entire amount of fees, he/she may loose his/her claim for admission to that seat.

(vii) If any candidate finds it impossible to be physically present for the admission session due to any unavoidable circumstances, he/she may authorize any other responsible individual to represent him/her for admission session. This representative must carry with him/her the Letter of Authorization for representation in the format given on the Vidyapeeth website as well as all the documents mentioned above. If the candidate or his/her representative fails to report for the admission session, on the date and time mentioned in Important information at a glance, his/her claim for admission to the respective course shall stand forfeited.

(viii) Admissions made at the admission sessions are provisional. These will be confirmed after verification of eligibility by the Vidyapeeth.

3.2 Application Procedure

A candidate, desirous of appearing at the entrance test, is required to complete the prescribed application form appended at the end of this brochure and submit the same to the Registrar of the Vidyapeeth with entrance test fee, on or before the scheduled date. The application form is also available on the Vidyapeeth Website.

Instructions for Completing the Application Form

This application form is only for All India Biotechnology Common Entrance Test 2016 for admission to all the three courses.

(i) The candidate shall avoid overwriting, cutting, erasing on the form. Any discrepancies in the statements and/or submission of incomplete form may lead to rejection of the form.

(ii) Black ballpoint pen shall be used for filling in the application form. All the entries in the form should be in CAPITAL LETTERS only.

(iii) Squares provided in the application form are only for writing alphabets in capitals for indicating name or for appropriate numbers. The alphabet or the number written in the square must not touch the edge of the square.

(iv) Fill the squares legibly and clearly without overwriting.

(v) The name mentioned in the form by the candidate shall be the same as in the documents of 10+2 examination. One square should be used only for one alphabet. Please leave one blank square between adjacent words. For example, the name Patil Amit Shekhar should be written as follows:

P	A	T	I	L		A	M	I	T		S	H	E	K	H	A	R

(vi) If the number of a date or month of birth is a single digit, it shall be prefixed with zero. For example, 5th June 2015 should be written as:

D	D	M	M	Y	Y	Y	Y
0	5	0	6	2	0	1	5

(vii) The candidate shall also fill up the necessary information in the attached admit card.

(viii) The candidate shall indicate clearly the examination centre at which he/she wishes to appear for examination by darkening the appropriate circle.

(ix) A passport size photograph shall be affixed at the appropriate place in the application form and the admit card. The photograph shall be firmly affixed by using gum. It shall not be pinned. Both the photographs should be taken from the same negative. The photographs shall be attested by the Principal/Head of the institution where the candidate has studied or by a gazetted officer. The attestation of the photograph shall be done in such a way that the photograph is not defaced.

(x) The declaration in the application form shall be signed both by the applicant and the mother/father/guardian of the applicant.

(xi) Address shall be written in capital letters. Use Punctuation wherever required as shown in the example. For example, if the address is 73/4, Adarsh Nagar, write as:

73/4, 'ADARSH NAGAR', _____

PUNE _____

_____

_____

(xii) Confirm by darkening circles whether the candidate has offered these subjects at HSC / 12th Std. examination.

(xiii) Columns for the year of passing 10th and 12th standard examination (Block No. 12).

For example, if the year is 2015 fill as

2	0	1	5

If appearing for HSC / 12th std. examination, darken the appropriate circle.

(xiv) Candidates shall indicate his preference of course by writing 1, 2 or 3 against his first, second or third choice. If he/she does not want a particular course as second or third choice, the boxes may be left blank.

(xv) Candidates are not required to enclose originals or photocopies of any certificates with the application form.

(xvi) The candidate shall invariably mention the number of his/her application form (as printed on it) and his/her name on the back of his/her demand draft.

(xvii) An incomplete application form and an application form, which is not accompanied by a demand draft of the prescribed fee of Rs. 1000/- (or Rs. 1600/- if the form is downloaded from the Vidyapeeth website), shall not be entertained and processed. This fee shall not be sent by money order. Please note that this fee is non-refundable.

3.3 Dispatch of Application Form

(i) The candidate should dispatch the application form, without detaching the admit card. The admit card will be posted to the candidate, indicating the address of the centre and duly signed by authority.

(ii) Application may be mailed to the following address: - Registrar, Dr. D. Y. Patil Vidyapeeth, Sant Tukaram Nagar, Pimpri, Pune - 411018. The application shall be accompanied by a demand draft of the amount of the test fee, i.e., Rs. 1000/- , Rs. 1600/- if the form is downloaded from the website. Add Rs. 500/- if the form is dispatched after the last date. The DD, in favor of "Registrar, Dr. D.Y. Patil Vidyapeeth", shall be drawn on any nationalized bank and payable at Pune. Those who submit the application in person may pay the test fee either by a DD or in cash. (Candidates are advised to obtain and maintain proof of draft and of dispatch of the application form. This may be useful for obtaining duplicate admit card, if required.)

(iii) If the application form is to be dispatched, it shall be dispatched by registered post/speed post/courier only.

(iv) The application must reach the above address (either by hand or by mail) on or before the last dates mentioned in the Important Information at a Glance.

(v) The Vidyapeeth shall not be responsible for any delay or loss of the application/admit card/or any other communication in transit. Such a delay shall not be condoned.

3.4 Conduct of the All India Biotechnology Common Entrance Test (AIBTCET – 2016)

(i) The test shall be conducted at the centres as mentioned in the Important Information at a Glance in this brochure and in the Admit Card sent to the candidate. The candidates must report at the center at least 30 minutes before the scheduled time of commencement of the test.

(ii) The test hall shall be opened 30 minutes before the commencement of the test. Candidates are expected to take their seats at least 20 minutes before the commencement of the test. If the candidates do not report in time, they are likely to miss some of the important instructions announced in the test hall.

(iii) Candidate shall not be allowed to appear for the test if he/she reaches the test hall after 11.30 a.m.

(iv) The candidates shall bring their admit cards and show the same, on demand, for admission to the test hall. A candidate, who does not have the admit card shall not be admitted to the test hall under any circumstances.

(v) A seat in the test hall, with a number, shall be allotted to each candidate.

(vi) A candidate shall not be allowed to carry inside the test hall any text material, printed or handwritten, chits or any other material except the admit card. The candidate shall not be permitted to bring calculators, slide rules, log tables, electronic watches with facilities of calculators, laptop computers, personal stereo systems, walkie-talkie sets, paging devices, mobile phones or any such objects/devices in the test hall. Possession or use of such devices during the test is prohibited and the candidate shall be liable to be expelled if found using or possessing them.

(vii) No candidate shall be allowed to go outside the test hall till the completion of the entire duration of the test. Once the candidate leaves the hall he/she will not be readmitted to the test hall. No exception will be made in this regard.

(viii) Parents, relatives or friends of the candidates shall not be allowed to enter into the premises of the centre.

(ix) Candidates are advised to bring with them a card board or a clip board, on which nothing should have been written. The board shall be useful to them while writing their responses in the answer sheet in case the tables in the test hall do not have smooth surfaces.

(x) Smoking in the test hall is strictly prohibited. Beverages or snacks of any kind are not allowed to be taken into the test halls during test hours.

(xi) Candidates shall maintain perfect silence and discipline in the test hall. Any conversation, gesticulation or disturbance in the test hall shall be considered as misbehavior and the candidates involved in such behavior shall be expelled from the test hall. Similarly, if any candidate is found using unfair means or allowing someone else to impersonate him/her, his/her candidature at the test shall be cancelled on the spot.

(xii) During the test time, the invigilator shall check the Admit Cards of the candidates to satisfy himself/herself about the identity of each candidate. The invigilator shall also put his/her signature in the place provided in the Answer Sheet on SIDE-1. (Refer specimen answer paper).

(xiii) After completing the test and before handing over the Test Booklet and the Answer Sheet back to the invigilator, the candidate shall check once again to see whether all the particulars required in the Test Booklet and the Answer Sheet have been correctly written. He shall ensure that the Seat Number, Centre Code, the Test Booklet number and Code are correctly written on the answer sheet.

(xiv) A warning bell shall be sounded 5 minutes before the beginning of the test and also to mark the half-time of the test time. A bell shall also be sounded 5 minutes before the closing time when the candidate must stop marking the responses or writing.

3.5 Mode of the test

The test consists of one question paper. The question paper consists of 100 objective-type questions of 1 mark each on Physics, Chemistry, Botany and Zoology (25 on each of them). The duration of the test is 1½ hours.

(A) Test Booklet

(i) Candidates shall be provided with a sealed Test Booklet 5 minutes before the scheduled time of the Test. The candidate shall write with black ballpoint pen the required information regarding: Seat Number, Name, Centre Code and Centre of examination in the columns on the Test Booklet without opening the seal.

The candidates are advised not to open/break the seal of the test booklet before they are instructed to do so by the invigilator.

(ii) In the Test Booklet, there will be 100 items/questions serially numbered from 001 to 100. Each item shall have four options marked (A), (B), (C) and (D). Out of these four options, only one will be correct. The correct options should be selected and marked on the answer sheet.

(B) The Answer Sheet

(i) An answer sheet will be given to the candidates 15 minutes before the scheduled time of the test. Please refer to specimen answer sheet. (Refer Annexure II)

(ii) This answer sheet is of a special type and will be scanned on the computer by ICR. Therefore, the candidate shall handle the answer sheet very carefully. There will be two sides of the answer sheet.

iii) SIDE-I

This side of the answer sheet begins with instructions. The following information is to be filled neatly and accurately with a black/blue ball point pen only:

a) Name
b) Center Code
c) Center (city in words)
d) Application Form No.
e) Seat no. (as mentioned in Admit Card)
f) Signature of the candidate with date
g) Signature of the Invigilator with date
h) Test Booklet Number:
Each test booklet has a number. Write it at the appropriate place.

(iv) SIDE-II

This side is to be used for marking responses to questions numbered 001 to 100. First, enter your seat number, Test booklet serial number & test booklet code with black ballpoint pen only. For every question number, four circles are provided under columns A, B, C and D. The letters A, B, C, and D also appear within the circles. Darken appropriate circle with black ballpoint pen.

The candidates must indicate their response to the question by darkening the appropriate circle completely. For example:

Q.3 Taj Mahal is located in

(A) Mumbai (C) Delhi
(B) Agra (D) Jaipur

The correct response is (B). The candidate will locate question number in the answer sheet and darken the circle (B) as shown below:

	(A)	(B)	(C)	(D)
1.	○	○	○	○
2.	○	○	○	○
3.	○	●	○	○
4.	○	○	○	○

If the candidate darkens more than one circle or if he does not mark his response as shown above and marks his response as shown below, his response will be treated as wrong and will not be given marks.

	(A)	(B)	(C)	(D)
1.	○	○	○	○
2.	○	⊘	●	○
3.	○	○	●	○
4.	○	○	○	◑

(v) The candidates are advised to decide about the answer before they mark it on the answer sheet. They should ensure that the circle is completely darkened. A lightly or faintly darkened circle is a wrong method of marking and may not be accepted by the scanner.

(vi) If the candidate does not want to attempt any particular question, he is advised to leave circles given against that question blank.

(vii) The candidate shall not fold the answer sheet; nor shall he/she make any stray marks on it.

(viii) A specimen copy of the answer sheet is given at Annexure II. Candidates are advised to go through it and get conversant with it. The candidate shall learn from this answer sheet as to how to fill in the information asked for and how to mark the answers. This shall help the candidates to do the things correctly and save their time.

(C) Changing an answer

(i) If a candidate wants to change any answer marked by him on the answer sheet, he shall completely erase the existing mark and then darken the appropriate circle. Candidate must not leave any visible mark in the circle after erasing. Otherwise the response may be rejected by the scanner. Such erasing can be avoided if the circles are darkened thoughtfully.

(ii) Test booklet number, as filled in by the candidate in the answer sheet, shall be accepted as final for the purpose of evaluation. When the booklet number is left blank or more than one booklet number are indicated on the answer sheet, it shall be deemed as incorrect booklet number and such answer sheet shall not be evaluated.

(D) Pens, Erasers and Pencils

The candidate shall bring his own materials such as black ballpoint pen. In case ballpoint pen of any colour other than black is used, the answer sheet may be rejected by the ICR. Under such circumstances the entire responsibility shall rest with the candidate. The candidate must also bring his own sharpener and eraser of good quality.

(E) Important Instructions for Marking

(i) Marking shall be dark and shall completely fill the circle.
(ii) Darken only one circle for each question.
(iii) Do not fold the answer sheet or make any stray marks on it.
(iv) Make the marks only in the spaces provided.
(v) There shall be no negative markings.

(F) Rough Work

The candidate shall not do any rough work or writing work on the answer sheet. All rough work shall be done in the Test booklet itself.

(G) Merit List

(i) The Vidyapeeth shall prepare a merit list of the candidates who appear for All India Common Entrance Test, in accordance with the total marks obtained by them in Physics, Chemistry, Botany and Zoology taken together. The candidates shall be called for admission as per their ranking in this list. There shall be no verification of marks or reassessment of papers.

(ii) The merit list will be displayed on the notice board and on the Vidyapeeth website: www.dpu.edu.in. sufficient eligible candidates in the merit list will be called for counseling and on-the-spot admission session according to their rank in the merit list.

(iii) Tie-breakers

In case of equal marks at the entrance test, the following procedure shall be adopted for deciding inter-se merit:

First level: A candidate with higher marks in Biology at the entrance test shall be preferred. If the tie still persists, then-

Second level: A candidate with higher marks in Chemistry at the entrance test shall be preferred. If the tie still persists, then-

Third level: A candidate with higher percentage of aggregate marks at the HSC (or equivalent) examination shall be preferred. If the tie still persists, then-

Fourth level: A candidate with higher percentage of aggregate marks at SSC examination shall be preferred.

3.6 Admission Session

(i) The admission sessions will be conducted at the Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Tathawade, Pune. as per the schedule given in Important Information at a Glance in this brochure. Failure to report for admission on the scheduled date and time shall result in instantaneous cancellation of the claim of the candidate to the seat. It shall be the candidate's responsibility to ascertain the result of entrance test.

(ii) If selected, the candidate shall remain present for on the spot admission, as per the schedule given in Important Information at a Glance in this brochure at his own expense.

(iii) Only the candidate and one of his/her parents/guardian shall be allowed into the admission hall. The candidates shall be called in the order of their ranking in the merit list.

(iv) The candidate must note that appearance at the entrance test and inclusion of name in the merit list does not necessarily mean that he/she shall get admission to a course. His/her admission to a course shall depend upon the availability of seats at the time when his/her turn comes.

(v) At the time of reporting for the admission, the candidate shall produce the documents (original and two sets of photocopies) listed in 'List of Documents' on the Vidyapeeth website. If the candidate is admitted to a course, these documents shall be retained by the Vidyapeeth till he completes the course. If the candidate fails to produce all or any of the above mentioned documents, his/her claim for a seat shall stand forfeited.

(vi) The selected candidate shall be required to submit the affidavit in the format given on the Vidyapeeth website and to pay the entire amount of Annual fees and the Vidyapeeth Eligibility fees, on the day of spot admission. **The annual fees** are to be paid through a demand draft, drawn on a nationalized bank favoring **'Director, Dr. D. Y. Patil Biotechnology & Bioinformatics Institute',** payable at Pune. The **Vidyapeeth Eligibility fee** shall be paid in similar manner favoring **'The Registrar, Dr. D. Y. Patil Vidyapeeth,** and Pune'. In case the candidate fails to pay the entire amount of fees, he/she may lose his/her claim for admission to that seat.

(vii) If any candidate finds it impossible to be physically present for the admission session due to unavoidable circumstances, he/she may authorize any other responsible individual to represent him/her for admission session. This representative must carry with him/her the Letter of Authorization in the format given on the Vidyapeeth website as well as all the documents listed in 'List of Documents' on the Vidyapeeth website. If the candidate or his/her representative fails to report for the admission session on the date and time mentioned in the schedule of admission, his/her claim for admission to the respective course shall stand forfeited.

(viii) Admissions made at the admission sessions are provisional. These will be confirmed after verification of eligibility of candidates by the Vidyapeeth.

3.7 Waiting List

(i) A waiting list for admission to the three courses shall be prepared and notified on the Vidyapeeth notice board. The candidates, who desire to have their names included in the waiting list, shall submit their applications for inclusion of their names in the waiting list. If no such application in writing is submitted during the interview, the candidate's name shall not be included in the waiting list.

(ii) The seats, which become vacant during the admission session, shall be kept vacant. The waiting list shall become operative from 1st Aug. 2016 onwards and the candidates in the waiting list shall be offered seats as per availability of seats. The waiting list shall be operative till all the vacant seats are filled or till 30th September (cut-off date), whichever is earlier.

4. Hostel Accommodation

Hostel and Mess facilities **(on payment basis)** are available on the campus for both boys and girls who wish to avail the same. The rooms are well furnished along with the amenities like Internet facility, Doctor on Call, Hot water facility, Central TV room are also available.

5. Ragging

Ragging in any form is a punishable offence in accordance with the "UGC REGULATIONS ON CURBING THE MENACE OF RAGGING IN HIGHER EDUCATIONAL INSTITUTIONS, 2009", and committing this act of indiscipline shall result in – PUNISHMENT UNDER THE PROVISIONS OF ANY PENAL LAW FOR THE TIME BEING IN FORCE.

Candidates on admission will be provided with detailed guidelines related to ragging.

6. Disputes

Differences of opinion and disputes arising in the interpretation and implementation of the clauses in this brochure, if any, shall be referred to the Vice-Chancellor of Dr. D. Y. Patil Vidyapeeth, Pune and his decision shall be final and binding on all the concerned.

7. Court Jurisdiction

Any legal dispute arising out of the admission procedure of these courses and refund of fees of the Vidyapeeth shall be under Pimpri jurisdiction only.

8. Warning

The candidate seeking admission to any of the course of the Vidyapeeth, is warned against possible cheating by unscrupulous persons, who may promise an assure seat by extracting large sum of money from the candidate/parent. The Vidyapeeth has not appointed any such agent(s). The Vidyapeeth shall not in any way be responsible for the misdeeds of such person(s).

9. Discipline & Conduct of Rules

i) It is imperative that the students strictly adhere to the day of opening and closing of each term during academic year.

ii) The students must be present for all class tests, mid term tests, terminal & preliminary examinations. Strict disciplinary action is taken against those students who fail to attend the tests, Practical, Dissections, Tutorials, Demonstration beside clinics and theory classes etc.

iii) The students should complete all the term work such as Journals, charts or any other assignments as per schedule.

iv) The students and parents should specially note that, if the students fail to complete the term work regularly and has poor academic performance, he/she will not be granted the term and will not be allowed to appear for the Vidyapeeth examination.

v) The students should note that, he/she is responsible to the authorities of the institute not only for his/her conduct in the premises; but also for the conduct in general, out side the premises as well as the participation in any political/antisocial elements etc. If he/she is found involved in such activities, strict disciplinary action be taken against him/her.

vi) The students should help in maintaining the building decorum and the campus of the institute.

vii) If a students remains absent for lectures, practicals or class tests examination without prior permission of the Dean or the Head of the departments, he/she will be fined along with other punishments of academic nature as directed by the authorities.

viii) The students should read the notices regularly on notice boards in the academic complex, library and the department at various notice boards

ix) As per the rules and regulations of the affiliate Vidyapeeth and the Dental council of India New Delhi, 75% attendance in non-lecture teaching i.e. seminars, group discussion, tutorials, demonstrations, practicals, hospital posting and bed side clinics etc. also student must secure at least 50% marks for the total marks fixed for internal assessment in particular subject in order to be eligible to spear in final Vidyapeeth examination of that subject.

x) If the student remains absent from the institute for a continuous period of ten days without prior permission of the Dean, the management reserves the right to cancel his/her name from the roll. Such students will not be entitled for any refund of fees.

xi) Ragging is a serious conizable offence. Ragging the students in any form within or outside the college and hostel premises is strictly prohibited. Miscreants will be expelled from the instantly.

xii) The Dean reserves the right to remove from the roll the name of any student for failure to pay the college/hostel dues in time.

xiii) Consuming alcoholic drinks and drugs are strictly prohibited in the premises of the college & hostel. Involvements found in such thing will be deal with seriously.

xiv) Damaging the property of the college and it sister institutes like tampering with fixtures, fitting, equipments, instruments, furniture books, periodicals, walls, window, panels, vehicles will be viewed very seriously and is likely to result in instant expulsion of the student from college.

xv) Parents shall verify internal assessment record of their wards. Educational insurance is compulsory for all students.

Research Project Workshop

Practical Laboratory

ANNEXURE - I

SYLLABUS AIBTCET-16

PHYSICS

Unit I: Physical World and Measurement

Measurement:- Physics - scope and excitement; nature of physical laws; Physics, technology and society. Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Order of magnitude. accuracy and errors in measurement Dimensions of physical quantities, dimensional analysis and its applications.

Unit II: Kinematics

Scalars & Vectors :- Scalar and vector quantities; Position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors.

Unit vector; Resolution of a vector in a plane – rectangular components. Scalar and Vector product of vectors.

Motion in straight lines: - Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion .Uniform and non uniform motion, average speed and instantaneous velocity. Uniformly accelerated motion, velocity time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). Motion in a plane. Cases of uniform velocity and uniform acceleration Projectile motion. Equation of projectile path, time of flight, horizontal range, maximum height of projectile. Relative velocity

Unit III: Laws of Motion

Laws of Motion: - Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications.

Force:-Types of forces. General idea of gravitation, electromagnetic and nuclear forces. Moment of a force, torque, angular momentum, laws of conservation of angular momentum and is applications. Equilibrium of concurrent forces Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod .

Concurrent Co-planner forces :-Definition of resultant & equilibrant – statement of law of parallelogram of forces - derivation of expression for magnitude & direction of two concurrent coplanar forces – law of triangle of forces & its converse – Lami's theorem – problems.

Uniform circular motion:- Angular displacement, angular velocity and angular acceleration, relation between angular velocity and linear velocity. Dynamics of uniform circular motion: radial acceleration, Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on banked road).

Vertical circular motion due to earths gravitation, equation for velocity and energy at different positions of vertical circular motion. Kinematical equation for circular motion in analogy with linear motion.

Unit IV: Work, Energy and Power

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); nonconservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions coefficient of restitution – problems.

Unit V: Motion of System of Particles and Rigid Body

Motion of rigid body :-Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration. Kinetic energy of rotating body rolling motion, physical significance of moment of inertia, Values of moments of inertia, for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications. Angular momentum and its conservation.

Unit VI: Gravitation

Statement and explanation of law of gravitation, definition of G, derivation of relation between g & G. Keplar's laws of planetary motion. The universal law of gravitation. Acceleration due to gravity and its variation with altitude, latitude, depth. Gravitational potential energy and gravitational potential. Escape velocity. Orbital velocity of a satellite. Geo-stationary satellites launching of satellite, expression for period of orbiting satellite.

Brief explanation of inertial mass and gravitational mass, weightlessness condition in orbit.

Unit VII: Properties of Bulk Matter

Elasticity :- Elastic behavior, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Relation between elastics constants, Poisson's ratio; elastic energy. Determination of Y ,behavior of metal wire under increasing load, applications of elastic behavior of material.

Friction in solid :- Static and kinetic friction, laws of friction, rolling friction, lubrication.

Frictions in liquid :- Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes). Effect of gravity on fluid pressure.

Viscosity, Stokes' law, terminal velocity, Reynold's number, streamline and turbulent flow, critical velocity. Bernoulli's

theorem and its applications.

Surface tension :- Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise. Effect of impurity, temperature and detergent on surface tension. capillary action in wick of lamp.

Unit VIII Heat

Gas Laws Statement and explanation of Boyle's Law and Charle's Law, Definition of pressure and volume coefficient of gas, absolute zero, Kelvin scale of temperature, perfect gas equation, explanation of isothermal and adiabatic changes, Van-der-Waal's equation of state for real gases.

Mode of Heat Transfer :- Heat, temperature, Thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity. Heat transfer-conduction, convection and radiation, thermal conductivity.

Radiation :- Newton's law of cooling, Definition of Radiant energy, emissivity and absorptivity, perfect black body, statement and explanation of Kirchhoff's law, Qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Plank's law, qualitative explanation of solar constant and surface temperature of sun, principles and working of total radiation pyrometer, Green house effect

Unit IX: Thermodynamics

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes.

Second law of thermodynamics: reversible and irreversible processes. Heat engine and refrigerator.

Unit X: Behaviour of Perfect Gases and Kinetic Theory of Gases

Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure.

Kinetic interpretation of temperature; rms speed of gasmolecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

Unit XI: Oscillations and Waves

Oscillations:- Periodic motion - time period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring–restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum– derivation of expression for its time period.

Sound Wave :- Properties of sound, speed of sound in gas, Newton's formula for speed of sound, Laplace formula, effect of reassure, temperature, humidity and wind on speed of sound.

Definition of sound intensity, explanation of loudness and its unit, distinguish between noise and musical note, comparison of Doppler effect in sound and light.

Wave Motion :- Wave motion. Transverse and longitudinal waves, speed of wave motion relation between speed , velocity and frequency of a progressive wave. Definition of progressive wave & its characteristics, Derivation of equation of a progressive wave & its different forms, definition of wave intensity , mention expression for wave intensity & its unit, Principle of superposition of waves, reflection of waves, Beats, Doppler effect.

Standing wave :- standing waves in strings and organ pipes, fundamental mode and harmonics, effect. Free, forced and damped oscillations (qualitative ideas only), resonance.

Unit XII: Electrostatics

Electric Charges :- Electric Charges; Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.

Electrostatic field :- Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to adipole, torque on a dipole in uniform electric field. Mechanical force on unit area of the charge conductor, energy density of the medium. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside). Charged cylinder. Electric potential Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field.

Capacitors :- Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor. Van de Graff generator

Unit XIII: Current Electricity

Electric Current :- Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity. Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance.

Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel. Elementary idea of secondary cells. concept of super conductivity – explanation of critical temperature , critical field & high temperature superconductors – mention of uses of super conductors – thermistors & mention of their uses. Definition of emf & internal resistance of a cell – ohm's law applied to a circuit – problems.

Kirchhoff's laws:- Kirchhoff's laws and simple applications. Wheatstone bridge, metre bridge. Potentiometer - principle and its applications to measure potential difference and for comparing emf of two cells; measurement of internal resistance of a cell.

Unit XIV: Magnetic Effects of Current and Magnetism

Concept of magnetic field :- Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop.at hthe centre Magnetic induction at a point along the axis of a coil carrying current, Magnetic induction at a point on the axis of a solenoid,basic concept of terrestrial magnetism, statement & explanation of tangent law, construction & theory of tangent galvonameter, Fleming's left hand rule.

Ampere's law:- Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids, Force on a moving charge in uniform magnetic and electric fields. Cyclotron.

Force on a current-carrying conductor in a uniform magnetic field. Force on a current-carrying conductor in a uniform magnetic field.Force between two parallel current-carrying conductors-definition of ampere. Torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

Magnetism :- Origin of magnetism due to moving charges, equivalence between magnetic dipole and circular coil carrying current, definition of magnetic dipole moment, and its unit, torque acting on a magnet in uniform magnetic field, Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements.

Types of magnetic material :- Para-, dia- and ferro – magnetic substances, with examples. Ferromagentism on the basis of domain theory, curie temperature Electromagnets and factors affecting their strengths. Permanent magnets.

Unit XV: Electromagnetic Induction and Alternating Currents

Electromagnetic induction; Faraday's laws, induced emf and current; Lenz's Law, Eddy currents. Self and mutual induction. Alternating currents, peak and rms value of alternating current/voltage, Expression for energy stored in the coil, derivation for sinusoidal emf, reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, Expression for impendence & current in LCR series circuit by phasor diagram method , explanation of resonance, derivation for resonant frequency, brief account of sharpness of resonance & Q- factor, power in AC circuits with resistance, inductance and capacitance,power factor & wattless current. Qualitative description of choke ,basic ideas of magnetic hysteresis AC generator and construction & working of transformer, power losses in transformer , Principle & working of moving iron meter, explanation of transmission of electric power , advantages of AC & DC

Unit XVI: Electromagnetic waves

Need for displacement current, Electromagnetic waves and their characteristics (qualitative ideas only). Transverse nature of electromagnetic waves. Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses. Space communication, types of propagation of electromagnetic waves in atmosphere.

Unit XVII: Optics

Refraction at plane surface:- Refraction through a glass slab, expression for lateral shift and normal shift, total internal reflection and its applications, optical fibers, its application in communication.

Refraction through prism :- Refraction and dispersion of light through a prism. Prism formula, Deviation through thin prism, angular dispersion, and dispersive power, conditions for dispersion without deviation.

Refraction at spherical surface :-Reflection of light, spherical mirrors, mirror formula. Refraction of light, refraction at spherical surfaces, lenses, thin lens formula, len's maker's formula. Magnification, power of a lens, combination of thin lenses in contact, combination of a lens and a mirror. Scattering of light - blue colour of sky and reddish appearance of the sun at sunrise and sunset. Elementary idea of Raman effect.

Optical instruments : Human eye, image formation and accommodation, correction of eye defects (myopia, hypermetropia) using lenses. Microscopes and astronomical telescopes (reflecting and refracting) , compound microscope and their magnifying powers , reflecting telescope.

Wave optics: Brief explanation of Newton's corpuscular theory, Huygen's wave of theory and Maxwell electromagnetic theory, Wave front, wave normal and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle.

Interference :- Theory of Interference, conditions for constructive and destructive interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light .

Diffraction :- Distinguish between Fresnel and Fraunhoffer diffraction, diffraction due to a single slit, width of central

maximum, Rayleigh's criteria. Resolving power of microscopes and astronomical telescope.

Polarisation :- Polarisation, plane polarised light, explanation of plane of polarization and lane of vibration, Brewster's law, uses of plane polarised light and Polaroids.

Speed of Light :- Michelson's rotating mirror experiment to determine light importance of speed of light .

Unit XVIII: Dual Nature of Matter and Radiation

Introduction of Atomic physics Types of electron emission, description and theory of Dunnington's method of finding, e/m of an electron, explanation of types of spectra, emission and absorption spectra, brief account of Fraunhoffer lines, explanation of electromagnetic spectra with emphasis on frequency.

Photoelectric effect :- Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light, photoelectric cell and its application.

deBroglie's hypothesis :- Matter waves-wave nature of particles, de Broglie relation. Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained). Wave length of electron, principle of electron microscope, scanning of electron microscope, transmission electron microscope and atomic force microscope.

Unit XIX: Atoms & Nuclei

Bohr's atom model :- Alpha-particle scattering experiment; Rutherford's model of atom Bohr atomic model for hydrogen atom , Bhor's Postulates- expression for radius velocity, energy ,wave number ,spectral series of hydrogen ,energy level diagram, explanation of ionization & excitation of energy, limitation of Bhor's theory, explanation of Sommerfeld & vector atom models .

Lasers :- Interaction between energy levels & electromagnetic radiation, laser action, population inversion , optical pumping , properties of lasers, construction & working of Ruby laser,application of laser, brief account of photonics .

Nuclear Physics:- Characteristics of nucleus, Composition and size of nucleus, atomic masses, isotopes, isobars; isotones, qualitative explanation of liquid drop and nuclear magnetic resonance and its application in medical diagnostics as MRI nuclear forces and their characteristics, Mass-energy relation, mass defect; binding energyper nucleon and its variation with mass number; Nuclear fission with equation, Nuclear chain reaction ,critical mass, controlled & uncontrolled chain reactions, types of nuclear reactor , mention their principles, dispose of nuclear waste nuclear fusion. Stellar energy (carbon & proton cycle)

Radioactivity :- Laws of radioactivity, decay law ,explanation of decay constant ,half life period ,mean life, relation between half & mean life, unit of activity ,Bequerrel & Curie – artificial transmutation ,artificial radioactivity , radio isotopes & mention their uses, brief account of Biological effects of radiation & safetymeasures.

Elementary Particles :- basic concepts of decay , neutrino hypothesis, beta leptons & hadrons, Qualitative explanation of it , Quarks.

Unit XX: Electronic Devices

Energy bands in solids Energy bands in solids (Qualitative ideas only) conductor, insulator and semiconductor; semiconductor diode – I-V characteristics in forward and reverse bias, diode as a rectifier; I-V characteristics of LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor, transistor as an amplifier (common emitter configuration) and oscillator. Logic gates (OR, AND, NOT, NAND and NOR). Transistor as a switch.

Unit XXI: Communication Systems

Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and digital data); bandwidth of transmission medium. Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation. Need for modulation. Production and detection of an amplitude modulated wave.

CHEMISTRY

Unit I: Solid State

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects.

Electrical and magnetic properties-Band theory of metals, conductors, semiconductors and insulators and n & p type semiconductors , diamagnetism, paramagnetism, ferromagnetism.

Unit II: Solutions (Solution and colligative properties)

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions.

Colligative properties - relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, van't Hoff factor

Unit III: Electrochemistry

Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), Types of cell - Dry cell -electrolytic cells and Galvanic cells, lead accumulator. EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and emf of a cell, fuel cells, corrosion.

Unit IV: Chemical Kinetics

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenious equation

Unit V: Surface Chemistry

Types of Adsorption - physisorption and chemisorption, Factors affecting adsorption of gases on solids. catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysis colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multimolecular and macromolecular colloids; Properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion - types of emulsions.

Unit VI : General Principles and Processes of Isolation of Elements

Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron.

Unit VII: p -Block Elements

Group -15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen -Preparation properties & uses ; compounds of nitrogen, preparation and properties of ammonia and nitric acid, oxides of nitrogen (Structure only) ; Phosphorus - allotropic forms, compounds of phosphorus: preparation and properties of phosphine, halides PCl3 , PCl5 and oxoacids (elementary idea only).

Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties,

Dioxygen: Preparation, Properties and uses, classification of oxides, Ozone, Sulphur -allotropic forms;

Sulphur: Preparation properties and uses of sulphur-dioxide,

sulphuric acid: industrial process of manufacture, properties and uses; Oxoacids of sulphur (Structures only).

Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structures only).

Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit VIII: d and f Block Elements

d Block Elements General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of K2Cr2O7 and KMnO4.

f Block Elements Lanthanoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids.

Unit IX: Coordination Compounds

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (inqualitative inclusion, extraction of metals and biological system).

Unit X : Haloalkanes and Haloarenes.

(Halogen derivatives of alkanes and arenes)

Haloalkanes: Nomenclature, nature of C -X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation, stability of carbocations R-S and d-I configurations.

Haloarenes: Nature of C -X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only), stability of carbocations R-S and d-I configurations.

Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Unit XI: Alcohols, Phenols and Ethers

Alcohols: Nomenclature, methods of preparation, physical and chemical properties(of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol.

Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.

Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses

Unit XII: Aldehydes, Ketones and Carboxylic Acids

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes: uses.

Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII: Organic compounds containing Nitrogen

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

Cyanides and Isocyanides - will be mentioned at relevant places in text

Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

Unit XIV: Biomolecules

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates.

Proteins -Elementary idea of . - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes.

Hormones and Lipids- Elementary idea excluding structure.

Vitamins - Classification and functions.

Nucleic Acids: DNA and RNA

Unit XV: Polymers

Classification - natural and synthetic, methods of polymerization (addition and condensation), copolymerization, some important polymers: natural and synthetic like polythene, nylon polyesters, bakelite, rubber. Biodegradable and nonbiodegradable polymers.

Unit XVI: Chemistry in Everyday life

Chemicals in medicines - analgesics, tranquilizers antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.

Chemicals in food - preservation, artificial sweetening agents, elementary idea of antioxidants.

Cleansing agents- soaps and detergents, cleansing action.

Unit XVII:Metallurgy-2

Physic-chemical concepts involved in the following metallurgical operations - desilverisation of lead by parke's process-distribution law.Reduction of metal oxides-ellingham diagrams-relative tendency to undergo oxidation in case of elements Fe Ag,Hg,Al,C.Cr,and Mg.Blast furnace-metallurgy of iron-reactions involved and thier role, Role of each ingredient and enegetics .

Unit XVIII: Industrially important compounds

Manufactures of caustic soda by nelson's cell method, ammonia by Haber's process,sulphuric acid by contact process,potassium dichromate form chromite,uses chemical properties of sulphuric acid and potassium dichromate.

BIOLOGY

Unit I: Diversity of Living Organism

Introduction to Biology :- Definition of Biology and its main branches, Botany and Zoology, scope of Biology, branches of Biology (definition).Classical branches – morphology, cytology, histology, anatomy, physiology, developmental Biology, biosystematics, genetics, ecology, organic evolution and palaeontology.

Inter disciplinary branches :- biophysics, biochemistry, and biostatistics. Applied branches and career prospects – agriculture, entomology, sylviculture, pathology, apiculture, microbiology, and bioinformetics. Role of Biology in myths and disbeliefs.

Biosystematics :- What is life? biodiversity; need for classification; Three domains of life, concept of species:- three domains of life; taxonomy & systematics; concept of species and taxonomical hierarchy; binomial nomenclature; tools for study of taxonomymuseums, zorogical parks, herbaria, botanical gardens.

Five kingdom classification; salient features and classification of Monera, Protista and Fungi (mycota) into major groups: Lichens.

Viruses and Viroid,prions:- Chemical nature with one example of disease each-creutzfeldt- Jacob disease (CZD) and potato spindle tuber disease (PSTD)

Kingdom-Plantae:- Salient features and classification of plants into major groups - Algae, Bryophyta (metaphyta), Pteridophyta, Gymnospermae and Angiospermae (three to five salient and distinguishing features and at least two examples of each category); Angiosperms - classification up to class, characteristic features and examples.

Kingdom-Animalia :- Salient features and classification of animals non chordates up to phyla level and chordates up to classes level (three to five salient features and at least two examples).

Unit II: Structural Organisation in Animals and Plants

Morphology of Plants :- Morphology and modifications; tissues; anatomy and functions of different parts of flowering plants: root, stem, leaf, inflorescence; cymose and racemose, flower (homochlamydeous, heterochlamydeous) fruit and seed (to be dealt along with the relevant practical of the Practical Syllabus).

Study of Animal tissues :-Animal tissues (epithelial, connective, nervous, muscular) Study of Animal Type Example Cockroach:- morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (a brief account only)

Unit III: Cell Biology

Organisation of cell :- Cell theory and cell as the basic unit of life; structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles – structure and function; endomembrane system, endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus, nuclear membrane, chromatin, nucleolus.

Biochemistry of cell :- Chemical constituents of living cells: biomolecules, structure and function of proteins, carbodydrates, lipids, nucleic acids, enzymes, types, properties, enzyme action.

Cell Reproduction : cell cycle, mitosis, meiosis and their significance

Unit IV: Plant Physiology

Plant water relation & mineral nutrition :- Transport in plants; movement of water, gases and nutrients; cell to cell transport, Diffusion, facilitated diffusion, active transport; plant-water relations, Imbibition, water potential, osmosis, plasmolysis; long distance transport of water - Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; transpiration, opening and closing of stomata; Uptake and translocation of mineral nutrients - Transport of food, phloem transport, mass flow hypothesis; diffusion of gases. Mineral nutrition: Essential minerals, macro and micronutrients and their role; deficiency symptoms; mineral toxicity; elementary idea of hydroponics as a method to study mineral nutrition; nitrogen metabolism, nitrogen cycle, biological nitrogen fixation.

Photosynthesis:- Bioenergetics- introduction,light as the source of energy and ATP as energy currency. photosynthesis as a means of autotrophic nutrition; site of photosynthesis-chloroplst pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non cyclic photophosphorylation; chemiosmotic hypothesis ; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

Respiration:- exchange of gases; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient, Pasteur effect.

Plant growth and development:- seed germination; phases of plant growth and plant growth rate; conditions of growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA; seed dormancy; vernalisation; photoperiodism.

Unit V: Human Physiology

Human Nutrition:-

Digestion and absorption: alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; calorific values of proteins, carbohydrates and fats; egestion; nutritional and digestive disorders - PEM, indigestion, constipation, vomiting, jaundice, diarrhoea.

Human Respiration :- Breathing and Respiration: Respiratory organs in animals (recall only); Respiratory system in humans; mechanism of breathing and its regulation in humans – exchange of gases, transport of gases and regulation of respiration, respiratory volume; disorders related to respiration - asthma, emphysema, occupational respiratory disorders.

Circulation:- Body fluids and circulation: composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.

Excretion & Osmoregulation :- Excretory products and their elimination: modes of excretion - ammonotelism, ureotelism, uricotelism; human excretory system - structure and function; urine formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders - uraemia, renal failure, renal calculi, nephritis; dialysis and artificial kidney.

Human skeleton & Locomotion :-Locomotion and movement: types of movement - ciliary, flagellar, muscular; skeletal muscle - contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal system - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

Control & Co-ordination :-Neural control and coordination: neuron and nerves; Nervous system in humans – central nervous system; peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse; reflex action; sensory perception; sense organs; elementary structure and function of eye and ear. A brief study of epilepsy, Parkinson's disease alzheimer's disease and huntington'

Chemical coordination and regulation: endocrine glands and hormones; human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary Idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goit, exophthalmic goiter, diabetes, Addision's disease.

Unit VI : Continuity of Life

Reproduction in plants :- Reproduction in organisms: reproduction, a characteristic feature of all organisms for continuation of species; asexual reproduction modes of reproduction - asexual and sexual reproduction; modes – binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants. Sexual reproduction in flowering plant: flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and and embryo, development of seed and formation of fruit; special modes-apomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.

Early development of frog-structure of egg, cleavage, blastulation, gastrulation, derivatives of primary germ layers.

Human Reproduction:- male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilization embryo development up to blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea). Reproductive health: need for reproductive health and prevention of sexually transmitted diseases (STD); birth control – need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies– IVF, ZIFT, GIFT (elementary idea for general awareness).

Unit VII Genetics and Evolution

Genetic basis of inheritance:- Heredity and variation: Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance.

Chromosomal basis of inheritance:- chromosome theory of inheritance; chromosomes and genes; Sex determination – in

humans, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorder in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes, Turner's syndrome,Cri-du-Chat syndrome.gene disorders-sickle cell anemia, hemophilia.

Gene – Its nature, expression & regulation:- Molecular basis of inheritance: search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; transcription, genetic code, translation; gene expression and regulation - Lac Operon; Genome and human genome project; DNA fingerprinting.

Unit VIII Evolution

Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidence); Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution – variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy - Weinberg's principle; adaptive radiation; human evolution.

Unit IX. Biology and Human Welfare

Man in health and diseases-concept of Homeostasis-the central dogma in physiology – definition meaning of internal environment. Factors to be kept constant to achieve homeostasis, Example to illustrate homeostasis.

Human Health and diseases:- pathogens; parasites causing human diseases (malaria, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology - vaccines; cancer, HIV and AIDs; Adolescene, drug and alcholol abuse. Improvement in food production : Plant breeding, tissue culture, single cell protein, Biofortification, Apiculature and Animal husbandry.

Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

Animal Husbandry:- Management of farms and farm animals (dairy, poultry, animal breeding, bee keeping, fisheries, sericulture, lac culture.

Vermiculture Definition and procedure, vermicomposed – degradation of organic waste and role of earthworm in soil fertility.

Unit X Biotechnology and Its Applications

Process & Application:- Principles and process of biotechnology: genetic engineering (recombinant DNA technology). Transposons, plasmids, bacteriophages, production of restriction fragmentes, preparing and cloning DNA library, gene amplification.

Application of biotechnology:- in health and agriculture: human insulin and vaccine production, gene therapy; genetically modified organisms - Bt crops; transgenic animals; Biosafety issues biopiracy and patents.

Enhancement in food production:- Plant breeding, tissue culture, concept of cellular totipotency, requirement of tissue culture, callus culture, suspension culture, single cell protein, biofortification.

Unit XI Ecology and Environment

Habitat and niche: - Organisms and environment: habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution.

Ecosystems:- patterns & energy flow, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services - carbon fixation, pollination, oxygen release.

Biodiversity and its conservation:- concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks and sanctuaries. Benefits of biodiversity-economic traditional crop varieties, animals of food value, medicinal plants harvested form wild habitats. Ecological/social-for controlling soin-water regimes and hydrology, for efficient organic residue management and soil fertility management, ethical cultural, spiritual and religious belief system centered around the concept of scared species, sacred groves and sacred landscapes.

Biodiversity depletion-anthropocentric causes-urbanization, expansion of griculture, deforestation, pollution, acidification of soil and water, Mining activities, desertification and loss of soil fertility. Intellectual property rights- patenting life forms.

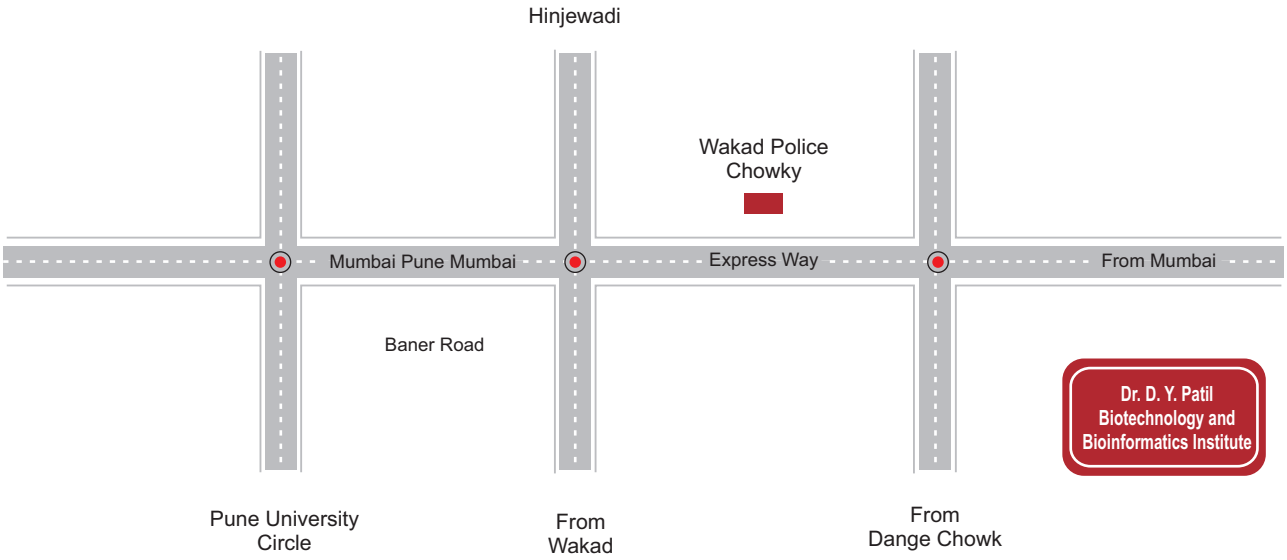
Environmental issues:- Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and global warning; ozone depletion; deforestation; any three case studies as success stories addressing environmental issues.

Economic Botany:- Introduction, oil yielding plants, groundnut and sunflower, cereals and millets, rice and jowar, pulses, pigeon pea, and Bengal gram, medicinal plants – Adathoda vasica, Ephedra gerardiana, dryopteris, santalum album, gymnema sylvestre, Ocimum sanctum, Phyllantus emblica, Spices – pepper, cloves and cardamom.

Elements of Plant Pathology:- Symptoms, etiology, type and nature of pathogens and methods of control with reference to the

following diseases :- banana bunchy top, tikka disease of groundnut, crown gall (of any common dicot plant)

Cultural Activity



DPU

Dr. D. Y. Patil Vidyapeeth, Pune

(Deemed University)
(Re-accredited by **NAAC** with a **CGPA** of **3.62** on a four point scale at **'A' Grade)**
(An ISO 9001 : 2008 Certified University)

Sant Tukaram Nagar, Pimpri, Pune - 411 018, Maharashtra, India.
Tel. No. : (020) 27805000, 27805001. Fax (020) 27420010
E-mail : info@dpu.edu.in • Website : www.dpu.edu.in

Dr. D. Y. Patil Biotechnology & Bioinformatics Institute

Tathawade, Pune : 411 033
Tel : (020) 65101870, 65101871
E-mail : info.biotech@dpu.edu.in • Website : www.biotech.dpu.edu.in