

DPU

Dr. D. Y. PATIL VIDYAPEETH, PUNE
(Deemed to be University)

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on four point scale at 'A++' Grade)
(Declared as **Category - I University** by UGC Under Graded Autonomy Regulations, 2018)
(An ISO 9001:2015, ISO 14001:2015 Certified University)

Dr. D. Y. Patil Biotechnology and Bioinformatics Institute

Information Brochure 2024-25

Online Proctor Based All India Biotechnology Common Entrance Test
(AIBTCET - 2024)

for Admissions to

B. TECH. BIOTECHNOLOGY

B. TECH. (MEDICAL) BIOTECHNOLOGY

**M. TECH. (INTEGRATED) BIOTECHNOLOGY
PROGRAMMES**





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
is pleased to declare the
Dr. D. Y. Patil Vidyapeeth
(Deemed to be University u/s 3 of the UGC Act, 1956)
Sant Tukaram Nagar, Pimpri, Dist. Pune, Maharashtra as
Accredited
with CGPA of 3.64 on four point scale
at A⁺⁺ grade
valid up to February 07, 2029*

Date : February 08, 2022



*S. C. Sarna
Director*



EC(SC)/92/3rd Cycle/MHUNGNI10146

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, the Vidyapeeth has been

Accredited (3rd Cycle) by the National Assessment and Accreditation Council (NAAC) with a CGPA of 3.64 on 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." All our

hospitals viz Medical, Dental, Ayurved and Homeopathy are NABH accredited and laboratories are NABL accredited.

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

These programmes are offered by 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 Online Proctor Based Common Entrance Test for admission to the professional course of your choice at the Institute.

Dr. P. D. Patil
Chancellor

Pro Chancellor'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.

Dr. (Mrs.) Bhagyashree P. Patil

Pro Chancellor

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 students have learned and not necessarily what they were taught. The Vidyapeeth has constituted APEX Committee for preparing vision and plan of action for

implementing the provision made and NEP 2020 by UGC, accordingly course curriculum is designed.

With these commendable achievements, I believe that there is still scope for us to become the best 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. All our hospitals viz Medical, Dental, Ayurved and Homeopathy are NABH accredited and laboratories are NABL accredited.

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 Dr. D. Y. Patil Vidyapeeth, Pune to pursue and attain your future dreams and professional objectives in the area of health sciences including Biotechnology and wish to extend my heartiest welcome on behalf of the entire Vidyapeeth fraternity. I wish you all the best.

Dr. N. J. Pawar
Vice Chancellor

Pro Vice Chancellor'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 (DYPBBI), Tathawade, 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 Centre. 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 with a few thousands of books, a technically advanced computer laboratory, a center of excellence as microbial diversity department, in-house canteen and separate hostel accommodation for male and female students and entire WAN network with speed up to 140 Mbps.

In addition to modern infra-structure, the team at DYPBBI is constituted of highly qualified and competent faculty with national and international experience in teaching and research. The centre 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 national and international agencies such as Sweden SIDA, 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's capacity and capability in the field of Biotechnology and Bioinformatics education. The institute hosts a number of fully equipped laboratories for teaching and research to perform experiments using modern techniques such as molecular biology, animal tissue culture, plant tissue culture etc. Further the institute has a modern and state-of-the art bioinformatics laboratory for advanced teaching and research.

I wish good luck to aspiring candidates for their 'All India Biotechnology Online Proctor Based Entrance Test' and shall be looking forward to seeing you enroll as a part of DPU family, in future.

Dr. (Mrs.) Smita Jadhav
Pro Vice Chancellor

1st Convocation 10th April, 2010



Felicitation of Chief Guest
Shri. Sushilkumar Shinde
The then Union Minister of Power, Government of India

Conferring the degree of
Doctor of Science (Honoris Causa) on
Baba Ramdev ji
Founder Patanjali Yogpeeth, Haridwar



Conferring the degree of
Doctor of Science (Honoris Causa) on
Prof. U. R. Rao
*Former Chairman,
Indian Space Research Organization
(ISRO)*



2nd Convocation 18th March, 2011



Felicitation of Chief Guest **Dr. A. P. J. Abdul Kalam**,
Former President of India



Conferring the degree of
Doctor of Science (Honoris Causa) on **Dr. Vijay Bhatkar**,
Chairman, ETH Ltd. and former Director CDAC



Conferring the degree of
Doctor of Science (Honoris Causa) on **Dr. P. Venugopal**,
*Chairman, Alchemist Medical Division and
Former Director AIIMS, New Delhi*



Conferring the degree of
Doctor of Letters (Honoris Causa) on **Advocate Ujjwal Nikam**,
Special Public Prosecutor, Government of Maharashtra



Conferring the degree of
Doctor of Letters (Honoris Causa) on **Dr. Narendra Jadhav**,
Member, Planning Commission, Government of India

3rd Convocation 9th June, 2012



Felicitation of Chief Guest
Smt. Pratibha Devisingh Patil,
President of India

Conferring the degree of
Doctor of Letters (Honoris Causa) on
Shri. Mohan Dharia,
*Former Cabinet Minister and
Eminent Environmentalist*



Conferring the degree of
Doctor of Letters (Honoris Causa) on
Shri. Montek Singh Ahluwalia,
*Deputy Chairman, Planning Commission,
Government of India*



4th Convocation 14th April, 2013



Felicitation of Chief Guest **Shri. Sharadchandra Pawar**,
*The then Union Minister of Agriculture & Food Processing Industry,
Government of India*



Conferring the degree of Doctor of Letters (Honoris Causa) on
Shri. B. M. alias Babasaheb Purandare,
Eminent Historian and play-writer



Conferring the degree of Doctor of Science (Honoris Causa) on
Dr. Krishnaswamy Kasturirangan,
an Architect of India's Space Research Programme



Conferring the degree of Doctor of Science (Honoris Causa) on
Prof. M. S. Swaminathan,
Eminent Agricultural Scientist

5th Convocation 26th April, 2014



Felicitation of Chief Guest
Hon'ble Shri. Shrinivas Patil
Governor of Sikkim, India

6th Convocation 26th June, 2015



Felicitation of Chief Guest
Hon'ble Shri. Pranab Mukherjee,
President of India



Conferring the degree of Doctor of Letters (Honoris Causa) on
Shri. Sharad Pawar,
Member of Parliament (Rajya Sabha)



Conferring the degree of Doctor of Science (Honoris Causa) on
Shri. Abhijit Mukherjee
Member of Parliament (Lok Sabha)



Conferring the degree of Doctor of Science (Honoris Causa) on
Dr. Raghunath Mashelkar
National Research Professor

7th Convocation 1st April, 2016



Felicitation of Chief Guest **Dr. Harsh Vardhan,**
*Minister of Science and Technology and Earth Sciences
Government of India*



Conferring the degree of Doctor of Science (Honoris Causa) on
Dr. C. N. R. Rao,
National Research Professor & Linus Pauling Research Professor

8th Convocation 8th April, 2017



Felicitation of Chief Guest **Shri. Nitin Gadkari**,
*Union Minister of Road Transport, Highways and Shipping,
Government of India*



Conferring the degree of Doctor of Science (Honoris Causa) on
Shri. A. S. Kiran Kumar, *Secretary, Department of Space,
Government of India and Chairman (ISRO)*



Conferring the degree of Doctor of Letters (Honoris Causa) on
Shri. Avdhoot Shivanand, *Shivyog Dham,
Avdhoot Shivanand Ashram, Gurugram, Haryana*



Conferring the degree of Doctor of Letters (Honoris Causa) on
Shri. Vinay Vilasrao Kore, *Head, Warana Co-operative Industrial &
Educational Complex, Kolhapur*

9th Convocation 29th March, 2018



Felicitation of Chief Guest
Shri. M. Venkaiah Naidu,
Hon'ble Vice President of India



Felicitation of
Shri. Girish Bapat
Hon'ble Guardian Minister, Pune



Felicitation of
Dr. D. Y. Patil
Former Governor of Bihar



Doctor of Science degree (Honoris Causa) conferred on
Prof. Achyuta Samanta
*Founder, KIIT and KISS, Bhubaneswar
Member of Parliament (Rajya Sabha)*



Doctor of Letters degree (Honoris Causa) conferred on
Dr. Pratapsinh G. Jadhav
*Chairman, Pudhari Publications Pvt. Ltd.,
Kolhapur*



Doctor of Letters degree (Honoris Causa) conferred on
Adv. Vishnu R. Parnerkar
President, Guru Seva Mandal, Parner, Maharashtra

10th Convocation 13th April, 2019



Tree plantation with the hands of Chief Guest
Dr. Bhushan Patwardhan
*Hon'ble Vice Chairman, University Grants Commission,
New Delhi*



Members of Board of Management with
Chief Guest **Dr. Bhushan Patwardhan**
*Hon'ble Vice Chairman, University Grants Commission,
New Delhi*



Felicitation of
Dr. Bhushan Patwardhan
*Hon'ble Vice Chairman, University Grants Commission,
New Delhi*



Felicitation of
Dr. D. Y. Patil
Former Governor of Bihar



Doctor of Letters degree (Honoris Causa) conferred on
Sant Shri Suman Bhai
Kuladhipati, Mountirth, Ujjain



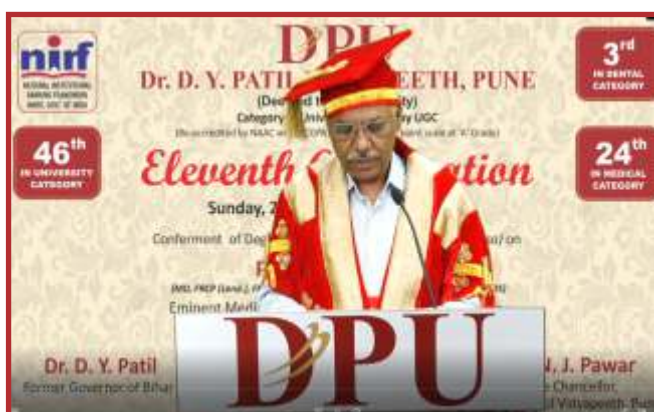
Doctor of Letters degree (Honoris Causa) conferred on
Shri B. J. Khatal Patil
*Former Cabinet Minister,
Government of Maharashtra*

11th Convocation 28th June, 2020

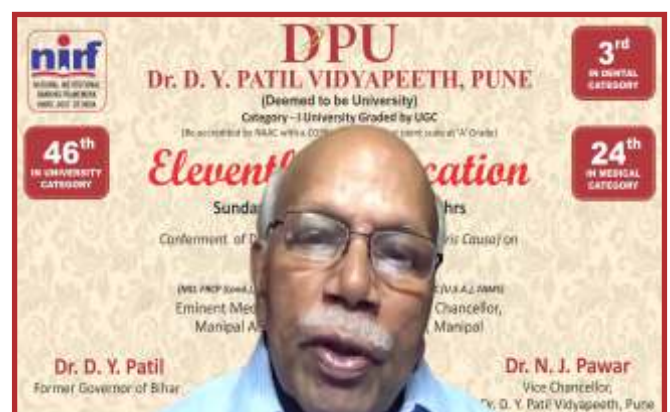
This year due to COVID 19 Pandemic situation all over the world, Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University) had conducted its 11th Convocation virtually on Sunday, 28th June, 2020 at 4.00 p.m. Hon'ble Dr. P. D. Patil, Chancellor, Dr. D. Y. Patil Vidyapeeth, Pune delivered the Convocation Address. The Degree of Doctor of Science (*Honoris Causa*) was conferred on Dr. B. M. Hegde, Former Vice Chancellor, Manipal University, Mangalore. Around 22 candidates were awarded gold medals.



Lamp Lighting by the hands of Hon'ble Dr. P. D. Patil, Chancellor, Dr. D. Y. Patil Vidyapeeth, Pune



Address by Hon'ble Dr. N. J. Pawar, Vice Chancellor,
Dr. D. Y. Patil Vidyapeeth, Pune.



Address by Hon'ble Dr. B. M. Hegde,
Former Vice Chancellor, Manipal University, Mangalore.

12th Convocation 29th June, 2021

The Twelfth Convocation ceremony virtually (online) of Dr. D. Y. Patil Vidyapeeth, Pune was held on Tuesday, 29th June 2021, at 12 noon at the Dr. D. Y. Patil Vidyapeeth's Auditorium. The Chief Guest of the program was Hon'ble Dr. Dharendra Pal Singh, Chairman, University Grants Commission, New Delhi. The ceremony was presided by DPU Chancellor, Hon'ble Dr. P. D. Patil and Pro Chancellor, Hon'ble Dr. Bhagyashreetai Patil, graced the function. Vice Chancellor Dr. N. J. Pawar, presented the Vidyapeeth Report.

Padma Vibhushan Awardee Hon'ble Dr. Jayant Narlikar (Emeritus Professor, The Inter-University Center for Astronomy and Astrophysics, (IUCAA) and renowned educationist Hon'ble Prof. Ram Takwale, Chief Mentor, Maharashtra Knowledge Corporation Limited, Former Vice-Chancellor Pune University, Yashwantrao Chavan Maharashtra Open University, Nashik, Indira Gandhi National Open University, New Delhi) were honoured with Degree of Doctor of Science (*Honoris Causa*) at the convocation ceremony. The 1577 no. of degrees awarded to graduates in various disciplines, including 14 - Ph.D., 679 graduates, 874 Postgraduates, and 10 diplomas. Also, 22 students who have achieved excellence in various examinations of the University were honored with gold medals.



Hon'ble Dr. P. D. Patil
Chancellor DPU, Presided the Ceremony



Hon'ble Dr. Dharendra Pal Singh
Chairman UGC, Chief Guest of the Ceremony



Conferring the Degree of Doctor of Science (*Honoris Causa*) on

Hon'ble Dr. Jayant Narlikar
Emeritus Professor, (IUCAA)



Conferring the Degree of Doctor of Science (*Honoris Causa*) on

Hon'ble Prof. Ram Takwale
Former Vice-Chancellor YCM Open University, Nashik

13th Convocation 20th May, 2022



Felicitation of Chief Guest
Shri. Rajnath Singh
Defence Minister, Government of India



Conferring the Degree of Doctor of Letters (*Honoris Causa*) on
Dr. Abhay Firodia
Chairman, Force Motors Ltd., Pune



Felicitation of
Dr. Abhay Firodia
Chairman, Force Motors Ltd., Pune



Conferring the Degree of Doctor of Letters (*Honoris Causa*) on
Shri. Prataprao Pawar
Chairman, Sakal Media Group, Pune



Felicitation of
Shri. Prataprao Pawar
Chairman, Sakal Media Group, Pune



Conferring the Degree of Doctor of Science (*Honoris Causa*) on
Dr. Vedprakash Mishra
Pro Chancellor and Chief Advisor,
Datta Meghe Institute of Medical Sciences,
(Deemed to be University), Nagpur



Felicitation of
Dr. Vedprakash Mishra
Pro Chancellor and Chief Advisor,
Datta Meghe Institute of Medical Sciences,
(Deemed to be University), Nagpur

14th Convocation held on 14th August, 2023



Felicitation of Chief Guest
Shri Ramesh Bais
Hon'ble Governor of Maharashtra



Conferring the Degree of Doctor of Science (*Honoris Causa*) on
Shri. Arun Firodia
Chairman, Kinetic Group, Pune



Felicitation of
Shri. Arun Firodia
Chairman, Kinetic Group, Pune



Conferring the Degree of Doctor of Science (*Honoris Causa*) on
Dr. Pramod Chaudhari
Founder & Executive Chairman, Praj Industries Ltd., Pune



Felicitation of
Dr. Pramod Chaudhari
Founder & Executive Chairman, Praj Industries Ltd., Pune



Conferring the Degree of Doctor of Science (*Honoris Causa*) on
Dr. P. N. Razdan
Principal Advisor,
Quality Assurance & Excellence Cell,
Ramaiah Group of Institutions, Bangalore



Felicitation of
Dr. P. N. Razdan
Principal Advisor,
Quality Assurance & Excellence Cell,
Ramaiah Group of Institutions, Bangalore

Dr. D. Y. Patil Vidyapeeth, Pune

Dr. D. Y. Patil Vidyapeeth, Pune was established in 2003. It is situated in Pimpri, in the city of Pune.

The city is steeped in cultural, educational and political history. Pune was the cultural capital of the Marathas and rightly it has earned the sobriquet as the 'Queen of the Deccan'. It is situated at the height of 575 meters above the sea level, on the Deccan plateau in the Sahyadri ranges. The city is surrounded by verdant hills and the pristine lakes. Due to the picturesque setting of the city coupled with its salubrious climate, it has become a home for many after their retirement! That is why the city is also known as the 'Pensioner's Paradise.'

The city has a rich legacy in education. It is called the "Oxford of the East," as it has the highest number of Colleges and Universities compared to any other city in India. About 25,000 foreign students from over 99 countries are pursuing their education in Pune.

It has a large number of reputed educational and research institutes, such as Savitribai Phule Pune University, 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 is located at a distance of 13 km. from the Pune Railway Station and the Airport. The city is well connected to Mumbai and the entire country through rail, air and by road. The city also has an International airport!



Dagdusheth Ganpati



NCL



IISER, Pune

Salient Features		
Altitude	575 m	
Area	816 sq. km.	
Population	10.46 Million (approx)	
Language	Marathi, English, Hindi	
Climate	Max. Temp (C)	Min. Temp (C)
Summer	40	20
Winter	25	8
Rain	Moderate 75 cm. p.a.	



Shaniwarwada



NARI

About Vidyapeeth

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 on the recommendation of the University Grants Commission, New Delhi comprising of Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune vide their Notification No. F.9-39/2001- U.3 dated 11th January 2003.

Dr. D. Y. Patil Vidyapeeth, Pune (DPU) had a humble beginning with one institution under its fold. Over the last 20 years it has grown by leaps and bounds with the addition of 12 more professional institutions. Today the 13 institutions of Dr. D. Y. Patil Vidyapeeth, Pune have created a brand name “DPU” in the field of Medicine, Dentistry, Nursing, Physiotherapy, Optometry, Biotechnology, Management, Ayurved, Homeopathy, Design, Allied Health Sciences, Liberal Arts, Science & Technology and Online Learning. Dr. D. Y. Patil Vidyapeeth, Pune has state-of-the-art infrastructure and dedicated faculty over and above the respective council norms. All the programmes offered in these Constituent Units of the Vidyapeeth are duly recognized by the respective Councils such as NMC/DCI/INC/NCISM/NCH/AICTE/UGC/MSOTPT, etc.

Accreditation / Rankings / Recognitions:

- Achieved the Highest Benchmark in **Academic Excellence** with a **CGPA of 3.64** on four point scale at '**A++**' Grade by NAAC.
- Dr. D. Y. Patil Vidyapeeth, Pune is Included in the list of Institutions Deemed to be Universities **under section 12B of the UGC Act, 1956** by UGC.
- The Vidyapeeth is declared as **Category - I University** by UGC Under Graded Autonomy Regulations, 2018.
- In **NIRF Rankings 2023** conducted by Ministry of Education, New Delhi, the Vidyapeeth has ranked **46th** in **University Category**, **3rd** in **Dental Category** and **15th** in **Medical Category**.
- The Vidyapeeth is an **ISO 9001:2015, ISO 14001:2015** and **Green Education Campus** Certified University.
- Under **Swachh Campus Ranking 2019** of Higher Educational Institutions, conducted by Ministry of Human Resource Development (MHRD), Government of India, the university has achieved **9th rank** amongst the Cleanest Higher Educational Institutions in the Country in the category '**Residential Universities – UGC**'.
- DPU has received '**One District One Champion 2021-22**' Award for Swachata Action plan conducted by MGNCRE under Ministry of Education, Govt. of India.
- Recognised as “**Social Entrepreneurship Swachhata & Rural Engagement Cell**” (**SES REC**) **Institution**, by Mahatma Gandhi National Council of Rural Education, Department of Higher Education, Ministry of Education, Government of India in September, 2020.
- **Biotechnology and Bioinformatics Institute** recognized as **DST-FIST (Level-I) Institute**.
- **Medical College** has been **recognized** as a **Regional Centre** for conducting **revised Basic Course Workshop exclusively for PG teachers (rBCW-PG)** in stand-alone PG Institutions by **National Medical Commission, New Delhi** on 11th February 2021.
- All our hospitals viz Medical, Dental, Ayurved and Homoeopathy are **NABH** accredited and all laboratories are **NABL** accredited.
- The **Regenerative Medicine Lab** in the Dental College and the '**Sudhatatva Pharmacy**' of Ayurveda College are **FDA Approved and GMP Certified**.
- The Vidyapeeth is registered with **Foreign Contribution (Regulation) Act (FCRA)** in 2013 & re-registered in 2018.
- The Vidyapeeth is recognized as **Scientific and Industrial Research Organization (SIRO)** by Department of Scientific and Industrial Research (DSIR) since 2017.
- **DPU Ethics Committee** is re-registered by **Drug Controller General of India (DCGI)**.
- **DPU Unit of UNESCO Chair in Bioethics, Haifa** was established in May 2015.

Infrastructure & Learning Resources:

- DPU has always endeavored to deliver quality education in a globally benchmarked learning environment through modern amphitheatre-styled air-conditioned classrooms, hi-tech & well-furnished laboratories with avant-garde equipment have been provided for both teaching and research.
- All the institutions have excellent library resources with a large number of books, periodicals and e-journals besides the latest e-resources like SCOPUS, EBSCOHOST, Elsevier Clinical Key, Elsevier Clinical Flex, J-Gate, etc.
- DPU has a strong IT infrastructure with AV studio, dedicated Data Centre and in-house Software Development Cell (SDC). The entire campus and classrooms are Wi-Fi enabled with a bandwidth of >2 GBPS internet connectivity.
- The hostels have all the facilities including TV room, Wi-Fi connectivity, recreation room, well-equipped gym, visitors' room, guest rooms, reading room, 24x7 security service, CCTV surveillance cameras, mess facilities, cafeteria and solar power heaters.

Research / Collaborations:

- The success of DPU in establishing strong research credentials and a vibrant research culture are evidenced by progressive increase in number of publications, enhanced bibliometrics, receipt of external funding, continuing collaborations and development of new collaborations with world class universities.
- DPU established 'DPU Foundation for Innovation Incubation and Entrepreneurship' (DPU FIIE) a non-profit organization registered under section 8 of Companies Act, 2013.
- DPU signed various MoUs and collaborative agreements with many institutions in India and worldwide. The International linkages of DPU have helped it in drawing upon the wisdom built up at the partner institutions of repute. Some of the important ones are with Department of Global Health Education, Johns Hopkins University, USA; Public Health Queen's University, Belfast; University of Skövde, Sweden, Massachusetts Institute of Technology (MIT) and Harvard University, USA, etc.
- DPU offers Ph.D. and Post-Doctoral Scholarships. A scholar can also pursue Ph.D. in Interdisciplinary Sciences.
- The “Medical Journal of Dr. D. Y. Patil Vidyapeeth” has been indexed in SCOPUS and UGC-CARE. Also, “Journal of Dental Research and Review” has been indexed in UGC-CARE.

Memberships – National and International

- 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 and Research Centre, Pimpri, Pune
- Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune
- Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Tathawade, Pune
- Global Business School and Research Centre, Tathawade, Pune
- Dr. D. Y. Patil College of Nursing, Pimpri, Pune
- Dr. D. Y. Patil College of Physiotherapy, Pimpri, Pune
- Dr. D. Y. Patil Homoeopathic Medical College & Research Centre, Pimpri, Pune
- Dr. D. Y. Patil College of Ayurved & Research Centre, Pimpri, Pune
- Dr. D. Y. Patil Institute of Optometry & Visual Sciences, Pimpri, Pune
- Centre for Online Learning, Sant Tukaram Nagar, Pimpri, Pune.
- Dr. D. Y. Patil School of Allied Health Sciences, Pimpri, Pune
- Dr. D. Y. Patil School of Liberal Arts, Pimpri, Pune
- Dr. D. Y. Patil School of Design, Tathawade, Pune
- Dr. D. Y. Patil School of Science and Technology, Tathawade, Pune

From the Director's Desk

Dear Students,



Biotechnology deals with an array of important activities with actual as well as potential impact on every sphere of human life and welfare, Food security, environmental protection, disease diagnosis treatment and national security, Biotechnology and Bioinformatics play an important role in every sector. The field of Biotechnology has, of late, pervaded and percolated to every dimension of human activity, thus leading to employment generation, large scale generation of useful products, trade, 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. Bioinformatics is an indispensable ally of researchers in every area of biological research. NEP 2020 as per the guidelines of UGC and AICTE is being implemented in phasewise manner.

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 manufacturing of platform which chemicals are used in detergent, textile, food, leather, paper and pharmaceutical industry.

It is my immense pleasure to welcome you to Dr. D. Y. Patil Biotechnology and Bioinformatics Institute (DYPBBI), Dr. D.Y. Patil Vidyapeeth, Pune for developing a career in Biotechnology and Bioinformatics. DYPBBI is dedicated to train and develop students in the field of Biotechnology. DYPBBI offers both UG and PG courses in Biotechnology We also offer Ph.D. programme in Biotechnology and Bioinformatics. Learning at the Institute is supported by adequate and up-to-date infrastructure facilities including subject-specific laboratories and all relevant and modern instruments required for training. Recent Infrastructure support (DST-FIST) from the Department of Science & Technology (Govt. of India) is a big boost to develop our infrastructure further.

At the Institute, we have adequate number of quality faculty with expertise in various sub-areas in Biotechnology & Bioinformatics. International exposure and dedication is our other strength. We pay substantial attention to the essential requirement of hands-on experience through research projects. In this way, we ensure that the students become competent for further studies and employment at various organizations.

Beyond this, DYPBBI is an exciting place for co-curricular and extra-curricular activities such as symposia and seminars, students' fests, quiz competitions, Science-day activities, blood donation camps and other such activities. These events provide students an opportunity to develop management and communication skills, as well as creating an excellent ambience for education in Biotechnology and Bioinformatics. We are very proud of our past students, many of whom are well-placed after completion of their studies. I, along with my excellent team of student-centric teachers and administrative staff, welcome you to the exciting field of Biotechnology through DYPBBI. I wish you good luck for the forthcoming All India Biotechnology Online Proctor Based Entrance Test Examination and shall be looking forward to your admission at our Institute.

Dr. Neelu Nawani
Director

Biotechnology & Bioinformatics Institute Infrastructure



Main Building



Reception



Interior



Marigold Hostel (Boys)



Hydrangea Hostel (Girls)

About The Institute

The Institute

Dr. D. Y. Patil Biotechnology and Bioinformatics Institute (DYPBBI), Tathawade, Pune is established as one of the constituent unit of Dr. D. Y. Patil Vidyapeeth, (Deemed to be 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 and Animal Biotechnologists and Bioinformaticians. In addition, eminent visiting faculties from Industrial and Academic background are invited for their valuable expertise in the specialized topics covering Biotechnology and Bioinformatics. DYPBBI is also supported by DST-FIST for infrastructure.

Infrastructure

Institute is having a building with ninety 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. Institutional library has a rich collection of text books, reference books & national and international journals, including e-books and e-journals. Well-equipped laboratories as required for efficient teaching and research are in place. Computer laboratory is equipped 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 softwares, 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 and Plant Tissue Culture, Molecular Biology, Instrumentation, Engineering Graphics and two computer laboratories. Wet laboratories are equipped with spectrophotometers (UV-VIS, double beam), electronic balances, high speed cooling centrifuge, deep fridge-150°C, BOD incubators, HPLC, Gas chromatography, biosafety cabinets, 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:

Girls & Boys Hostel facilities are available on payment basis subject to availability. A well-built hostels of 92,800 sq. ft. area are available on campus for girls and boys separately, having mess facilities on payment basis. The rooms are well furnished along with the amenities like Internet, Telephone, Doctor on Call, hot water facility etc. Reading room & Central TV room are also available.

Research

Dr. D. Y. Patil Biotechnology and Bioinformatics Institute has established research facilities in Biotechnology and Bioinformatics. The Institute has received research funding from National & International agencies like Department of Science and Technology (DST), Govt. of India, Department of Biotechnology (DBT), Govt. of India & Swedish International Development Corporation Agency (SIDA), Sweden. The faculty members publish papers in National & International peer reviewed journals and present their research along with their students at National & International conferences. The Institute has published more than 350 research papers, 30 book chapters & more than 600 research abstracts. Nearly 20% students pursue higher studies in reputed national & international universities giving strong alumni to the Institute. Under bilateral exchange program our faculty and students are deputed to University of Skovde, Sweden. Students for exchange program are selected based on their overall academic performance. Further details are available on www.biotech.dpu.edu.in



Smart Class-Room



Students Lab-Practical



Research Lab



Student Hostel Room



Student Study Tour (NIO, Goa)

The Programmes

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

The degree programs are approved by AICTE, syllabi of all the degree programs are as per the guidelines of AICTE. The B. Tech Biotechnology, course has eight semesters & M. Tech (Integrated) Biotechnology course has ten semesters. Syllabus covers **basic subjects:** Physics, Chemistry, Basic Biology, Mathematics, Biostatistics, Microbiology, Biochemistry, Cell Biology, Engineering Courses, Molecular Biology, Genetics & Immunology.

Advance Biotechnology subjects: Genetic Engineering, Pharmacology & Toxicology, Biopharmaceuticals, Fermentation Technology, r-DNA Technology, Food and Environmental Biotechnology, Industrial Biotechnology, Bioprocess Engineering, Animal Tissue Culture, Plant Biotechnology, Quality Control Management,

Computer subjects: Introduction to Computers & C Programming, Computer networking, Operating system, Perl & Bioperl and few

Bioinformatics subjects: Bioinformatics, Drug Designing, Protein Modeling, Genomics, Proteomics, etc.

The B. Tech. Medical Biotechnology course has eight semesters. It covers **basic sciences subjects:** Physics, Cell Biology, Mathematics, Statistics and Chemistry.

Medical Related Subjects: Medical Biochemistry, Microbiology and Virology, Human Anatomy & Physiology, Pharmacology & Toxicology, Cancer Biology, Human Genetics, Biopharmaceuticals, Epidemiology and Developmental Biology.

Medical Technology Related Subjects: Analytical Techniques, Molecular Biology, Immunology, Genetic Engineering, Animal Cell Culture, Bioprocess Engineering, Tissue Engineering & Transplantation, Forensic Science, Nano medicine, Biosensors & artificial organs.

Engineering Subjects: Electronic and Instrumentation, Introduction to Computers & C programing, Biomedical Instrumentation and Biomedical devices.

Medical Informatics Related subjects: Bioinformatics, Molecular Modeling and Drug Designing, Genomics, Transcriptomics and Proteomics, Metabolic Engineering and System Biology.

Humanities subjects: Communication Skills, Environmental Sciences, Biosafety, Bioethics & IPR and Health Care Management.

Elective Courses: Clinical Research, Biopharmaceuticals, Metabolic Engineering, Agriculture Biotechnology, Cancer Biology, Structural Biology, Tissue Engineering, Vaccine Technology, Nanomedicine, Epidemiology & Public Health. 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, nutraceuticals, 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, nutraceuticals, etc. and in the fields of clinical research, drug discovery, epidemiology, cancer and AIDS research, regenerative medicine, forensic science, gene therapy, genetic counseling, eugenics,

Students will acquire knowledge in the following domains after completing the degree programs -

- 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



Student working in Polyhouse

Eligibility Criteria

Eligibility Criteria for appearing the Entrance Test

- The candidate should be an Indian National.
- Minimum age: 17 years on or before 31st December 2024
- The candidate must have either appeared at Higher Secondary Certificate (H.Sc. / Std. XII) examination OR equivalent qualification of any board in India or abroad, with Physics, Chemistry and Biology or Life Sciences (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 for NRI

A candidate in any of these categories shall have completed 17 years of age on or before 31st December 2024. He/she must have Physics, Chemistry, Biology or Life Sciences 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 type 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.



Laboratories



Library (Reading hall)

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	60	30

2. Distribution of Seats:

Courses	General Category Seats 95%	NRI Category Seats 5%
B.Tech. Biotechnology	57	3
B.Tech. (Medical) Biotechnology	57	3
M.Tech. (Integrated) Biotechnology	28	2

(NRI : Non Resident Indian)

Reservation will be as per directives 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 merit of the candidates, who have qualified at the AIBTCET-2024.

NRI Category:

A candidate belonging to this category is not required to appear at the AIBTCET-2024. 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 merit base. The candidate will be required to pay a processing fee of US \$ 200.

In case any seat earmarked for NRI 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-2024 and has / have applied for the seat separately in the prescribed form available in the Vidyapeeth office and website.

NRI:

A 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.

Important:

Under the NRI, category, 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, who are studying for the qualifying examination in schools located in India, are excluded.

Biotechnology and Bioinformatics Infrastructure

Research Facilities



Biochemistry Laboratory



Plant Tissue Culture Laboratory



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. Neelu Nawani	M.Sc., Ph.D. (Microbiology)	Director	28 years
2.	Dr. J. K. Pal	M.Sc. (Zoology), Ph.D. (Developmental Biology)	Research Director	45 years
3.	Dr. Minal Wani	M.Sc., Botany, Ph.D. (Plant Physiology)	Professor	28 years
4.	Dr. Nilesh Sharma	M.Sc., Ph.D. (Molecular Biology)	Professor	17 years
5.	Dr. Rajesh Kumar Gupta	M.Sc., Ph.D. (Life Science)	Asso. Professor	19 years
6.	Dr. Manjusha Dake	M.Sc., Ph.D. (Biochemistry)	Asso. Professor	24 years
7.	Dr. Shuchi Nagar	M.Sc., Ph.D. (Molecular Modeling & Computational Drug Design)	Asso. Professor	14 years
8.	Dr. Soumya Basu	M.Sc. (Microbiology) Ph.D. (Life Science)	Asso. Professor	20 years
9.	Dr. Rachna Pandey	M.Sc., (Botany) Ph.D. (Biotechnology)	Asso. Professor	24 years
10.	Dr. Palashpriya Das	M.Sc., M. Tech. Ph.D. (Marin Biotechnology)	Asso. Professor	12 years
11.	Dr. Supriya Kore	M.Sc. Ph.D.(Microbiology)	Asst. Professor	23 years
12.	Ms. Arti Kale	M.Sc. (Microbiology) SET	Asst. Professor	22 years
13.	Mr. Amol Salagare	M.Sc. (Microbiology) NET	Asst. Professor	17 years
14.	Dr. Amit Ranjan	M.Sc. (Biotechnology) Ph.D. (Cancer, Invasion & Metastasis)	Asst. Professor	16 years
15.	Dr. Satish Sasikumar	M.Sc. (Zoology), Ph.D. (Zoology / Developmental Genetics)	Asst. Professor	22 years
16.	Dr. Viniti D. Vaidya	M.Sc. (Microbiology), Ph.D. (Biotechnology)	Asst. Professor	10 years
17.	Dr. Swapnil Gaikwad	M.Sc., Ph.D. (Biotechnology)	Asst. Professor	14 years
18.	Dr. Afreen Huda	M.Sc., Ph.D. (Biotechnology)	Asst. Professor	14 years
19.	Dr. Ashwini Puntambekar	M.Sc., M.Phil, Ph.D. (Biotechnology)	Asst. Professor	19 years
20.	Dr. Manisha Junnarkar	M.Sc., Ph.D. (Biotechnology)	Asst. Professor	18 years
21.	Mr. Sampatkumar Jadhav	M. Tech. (Biotechnology), NET, GATE	Asst. Professor	13 years
22.	Dr. Jyoti Deshpande	M.Sc., Ph.D. (Biotechnology)	Asst. Professor	16 years
23.	Dr. Aditee Rane	M.Sc., Ph.D. (Physics)	Asst. Professor	6 years
24.	Dr. Heena Tabassum	B. Tech., M. Tech. Biotechnology, Ph.D. Biotechnology	Asst. Professor	12 years
25.	Dr. Supriyo Chowdhury	M. Sc. (Botany) Ph. D. (Plant Molecular Biology)	Asst. Professor	08 years
26.	Mrs. Rashmi Y. Pathe	M. E. (Communication Network)	Asst. Professor	16 years
27.	Dr. Subhayan Sur	M.Sc., Ph.D. (Biotechnology)	Asst. Professor	10 years
28.	Dr. Shatavari Kulshrestha	M.Sc., Ph.D. (Biotechnology)	Asst. Professor	6 years
29.	Dr. Amol Phule	M.Sc. Biotechnology, Ph.D. (Molecular Biology & Biotech.)	Asst. Professor	6 years
30.	Dr. Nidhi Aggarwal	M. Sc., Ph.D. (Biotechnology)	Asst. Professor	8 years
31.	Dr. Dimple Davray	M. Sc. (Life Science), Ph. D. (Bioinformatics)	Asst. Professor	1 year
32.	Dr. Amit Kumar Singh	M. Tech., Ph.D. (Biomedical Engineering)	Asst. Professor	1 year
33.	Dr. Latika Shendre	M. Sc., Ph.D. (Microbiology)	Asst. Professor	5 years
34.	Dr. Rabiya	M. Tech., Ph.D. (Biotechnology and Biochemical Engineering)	Asst. Professor	1 year
35.	Mrs. Vishakha Chobe	B. E., M. E. (Digital System)	Asst. Professor	13 years
36.	Ms. Madhavi Mali	M. Sc. (Mathematics), GATE	Teaching Asst.	1 year

Discipline & Conduct of the Student

1.1 Obligations of the Student

- 1.1.1 Conduct himself/herself properly
 - 1.1.2 Maintain proper behavior.
 - 1.1.3 Observe strict discipline both within the campus, hostel & outside of the Institution.
 - 1.1.4 Ensure that no act of his / her consciously or unconsciously brings the Institution or any establishment or authority connected with it into disrespect.
- 1.2 Any act/s by the student which is contrary to the clause (1), shall constitute **misconduct and/or indiscipline**, which include any one or more of the acts jointly or severally, mentioned hereinafter;
- 1.2.1 Any act of the student which directly or indirectly causes or attempts to cause disturbance in the lawful functioning of the Institution.
 - 1.2.2 The student who is repeatedly absent from the class, lectures, tutorials, practicals and other courses.
 - 1.2.3 The student not abiding by the instructions of the Faculty members and not interacting with them with due respect.
 - 1.2.4 Any student found misbehaving in the campus/class or behaving arrogantly, violently towards the faculty, staff or fellow student.
 - 1.2.5 The Students who is not present for all the class tests, midterm tests, terminal and preliminary examinations.
 - 1.2.6 Permitting or conniving with any person / parent / guardian, which is not authorized to occupy hostel room, residential quarter, or any other accommodation or any part thereof of the Institution.
 - 1.2.7 Obstruction to any student or group of students in any legitimate activities, in classrooms / laboratories / field or places of social and cultural activities within the campus of the Institute.
 - 1.2.8 Possessing or using any fire arms, lethal weapon, explosives, or dangerous substances in the premises of the Institution.
 - 1.2.9 Indulging in any act which would cause embarrassment or annoyance to any student / authority / staff or any member of the staff.
 - 1.2.10 Stealing or damaging any farm produce or any property belonging to the Institution, staff member or student.
 - 1.2.11 Securing admission in the Institution, to any undergraduate or post graduate program or any other course by fabrication or suppression of facts or information.
 - 1.2.12 If the student fails to complete the assignments regularly and has poor academic performance when assessed by the regular class teachers and internal assessment, he/she will not be allowed to appear for the Vidyapeeth examination.
 - 1.2.13 If a student remains absent for lectures, practical or class test and examinations without prior permission of the Principal or the head of the departments, she/he will not be compensated for extra class.
 - 1.2.14 Students should read the notices regularly on notice boards in the academic complex, library and the department notice boards.
 - 1.2.15 Damage of property of the college and its sister institutes like tampering with fixtures, fittings, equipments, instruments, furniture, books, periodicals, walls, windows panels, vehicles etc., will be viewed very seriously.
 - 1.2.16 Recording of any electronic images in the form of photographs, audio or video recording of any person without the person's knowledge; when such recording is likely to cause injury, distress, or damage the reputation of such person; is prohibited in any part of the College and hostel premises. The storing, sharing or distributing

of such unauthorized records by any means is also prohibited.

- 1.2.17 Use of mobile phones and head phones during college hours is prohibited.
- 1.2.18 As per the rules and regulations of the Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, 80% attendance in a subject for appearing in the examination is compulsory inclusive of attendance in non-lecture teaching i.e. seminars, group discussion, tutorials, demonstrations, practical's, hospital (tertiary, secondary, primary) posting and bedside clinics etc.
- 1.2.19 The Students must present in proper dress code with apron/ lab coat, name badge and identity card on all week days /working days and during clinical duties.
- 1.2.20 Admission of the student will be cancelled at any point of time in case of;
 - 1.2.20.1 Not submitting the required documents on time.
 - 1.2.20.2 Failing to fulfill required eligibility criteria of the program.
 - 1.2.20.3 Submission of fake or incorrect documents.
 - 1.2.20.4 Admission gained by resorting to fraudulent means, illegal gratification or any unfair practice detected at any stage during the entire program.
 - 1.2.20.5 Not paying the stipulated fees on time.

1.3 Prohibition of Ragging:

- 1.3.1 Ragging in any form is strictly prohibited in the campus and outside. The UGC Regulations on "Curbing the Menace of Ragging in Higher Educational Institutions, 2009" (as amended) and the MCI (Prevention and Prohibiting Ragging in Medical Colleges/ Institutions) Regulations 2009, and DCI Regulations on Curbing the Menace of Ragging in Dental Colleges, 2009 shall be applicable to all students of the Vidyapeeth.
- 1.3.2 It is mandatory to fill the online Anti Ragging undertaking, by every student at the time of the admission and on commencement of every academic year.
- 1.3.3 Smoking or consumption of alcoholic beverages, or use of banned materials inside the College, Hostel and Campus is strictly prohibited.. Any violation on the part of the students will be viewed very seriously and they will be suspended from the college immediately pending enquiry and in the case of hostellers, they will be expelled from the hostels immediately. Such students will not be permitted to attend classes/sit for examinations and enter the campus without the written permission of the competent Authority.

1.4 Attendance & Progress:

Each student shall always maintain decency, decorum and good conduct, besides keeping steady progress and required attendance. The conduct/ academic performance/ attendance of each student shall be reviewed periodically and appropriate action, including detaining from appearing for the Vidyapeeth Exam/ expelling from the Hostel or College, as the case may be, will be taken against the erring student. The students shall abide by such decision of the authorities of the Institution/Vidyapeeth.

1.5 Payment of Tuition and other Fees

- 1.5.1 On admission of candidates to the first year of the course of study, all the notified fees viz., annual tuition fee, registration and eligibility fee, health insurance, caution deposit, hostel and mess fee, etc., as applicable, should be paid on or before the prescribed date without fail. Any delay will attract penalty as specified. If any candidate fails to remit tuition fee and other fees within the last date as notified, he/she will forfeit his/her admission to the course concerned.

- 1.5.2 In respect of subsequent year(s) of study, tuition fee and other specified fees shall be paid on or before the date as notified to the parents/students and on the Notice Board of the Institution /College concerned. Late payment, if any, will attract penalty as specified.
- 1.5.3 Similarly, examination fee, as prescribed and notified from time to time, shall be paid on or before the due date. If there is any delay, student has to pay penalty as specified. If any student fails to remit the examination fee even after lapse of the period specified for payment with penalty, such student will not be issued Hall Ticket for the Vidyapeeth examination(s)/debarred from appearing in the Vidyapeeth examination(s).
- 1.5.4 All fees, once paid to the Vidyapeeth account, will not be refunded or adjusted for any other purpose under any circumstances.

1.6 Rules relating to Vidyapeeth examinations:

- 1.6.1 The candidates appearing for the Vidyapeeth theory examinations shall be under the direct disciplinary control of the Centre Incharge. Possession of cell phone or any electronic device or incriminatory materials by a candidate or found copying from any device in the examination hall, is strictly prohibited.
- 1.6.2 Disciplinary action will be initiated if any candidate indulges in any malpractice (unfair means) as enumerated in the Vidyapeeth Examination Manual.

1.7 Rules for Hostel Students

All inmates of the Hostel shall observe the following rules for the smooth and efficient running of the hostel and for their comfortable stay:-

- 1.7.1 Only bonafide students of Vidyapeeth are eligible for admission to the hostels.
- 1.7.2 Students who fail to remit the Hostel fee even after a reminder in writing, shall vacate the hostel room allotted to them, forthwith.
- 1.7.3 No posters or pictures should be stuck inside and outside the room or anywhere around the premises of the hostel or College. Hostlers should avoid sticking bills and posters on the windows, doors and walls (except name strips on the room door). In case the room is found not in order, fine will be levied on the erring student.
- 1.7.4 Inmates should switch off fans and lights before leaving their rooms.
- 1.7.5 The inmates are advised to close the taps after use in order to avoid wastage of water.
- 1.7.6 Dining services will be provided only in the mess and there will be no room service.
- 1.7.7 Whenever any hosteller falls sick the same should be reported by him/her to the warden who will provide all necessary assistance to get appropriate treatment or medicines.
- 1.7.8 While going out of hostel the students should enter their name in the register & sign the same by mentioning proper reason.
- 1.7.9 To leave the hostel premises, permission of the Chief Warden is absolutely necessary. Students who want to stay overnight to visit their parents or guardians should approach the Chief Warden for permission. Permission will be granted only after obtaining written request from the parent/guardian duly signed by them, which will be duly entered in a register maintained in each block by the Warden.
- 1.7.10 All rooms, corridors, toilets etc. must be kept clean and any student who violates the rule shall be expelled from the hostel.
- 1.7.11 Hostel facility is provided with a view to help the student to pursue his/her studies in good environment and to facilitate/ promote his/her academic progress. A student

who fails to keep up the congenial atmosphere and environment in the Hostel or to perform well and maintain academic progress shall not be allowed to use the hostel facility and shall vacate his/her room immediately on intimation from the Chief Warden/ Dean/Principal/Director of Faculties.

All students will be governed by the rules stated above and by those that will be framed from time to time during the academic year.

Failure on the part of the students to abide by the disciplinary rules will result in such punishment including expulsion from the College/Hostel as may be imposed by the Institution / Vidyapeeth / Head of the Institution.

The decision of the Institution/Vidyapeeth/Head of the Institution with regard to disciplinary cases shall be final and all the students shall abide by such decisions.

1.8 Powers of Competent Authority (Dean/Principal/ Director at the Institute level)

The Competent authority may impose any one or more of the following punishment/s on the student found guilty of misconduct, indiscipline, in proportion thereof:

- 1.8.1 Warning/reprimand
- 1.8.2 Fine
- 1.8.3 Cancellation/withheld scholarship / award / prize / medal.
- 1.8.4 Expulsion from the Hostel.
- 1.8.5 Expulsion from the institution
- 1.8.6 Cancellation of the result of the student concerned in the examination of the Institution.
- 1.8.7 Temporary annulment from the Hostel/ Institution.
- 1.8.8 Rustication from the Institution.

1.9 Procedure for Inquiry

If the competent authority is satisfied that there is a prima facie case inflicting penalties, mentioned in clause No. 8, the authority shall make inquiry, in the following manner:

- 1.9.1 Due notice in writing shall be given to the student concerned about his alleged act of misconduct / indiscipline.
- 1.9.2 Student charged shall be required within 15 days of the notice to submit his/her written representation about such charge/s.
- 1.9.3 If the student fails to submit written representation within specified time limit, the inquiry may be held ex parte.
- 1.9.4 If the student charged desired to see the relevant documents, such of the documents, as are being taken into consideration for the purpose of proving the charge/s, may at the discretion of the inquiry authority, be shown to the student.
- 1.9.5 The student charged shall be required to produce documents, if any in support of his defense. The inquiry authority may admit relevant evidence/ documents.
- 1.9.6 Inquiry Authority shall record findings on each implication of misconduct or indiscipline, and the reason for such finding and submit the report along with proceedings to the competent Authority
- 1.9.7 The competent Authority on the basis of findings, shall pass such orders as it deems fit.

The procedure prescribed above need not be followed, when the student charged admits the charges in writing.

1.10 Appeal

If the punishment/fine/rustication is imposed on a student by Dean/Principal/ Director, such a student shall be entitled to file an appeal before the Vice- Chancellor within thirty (30) days of the receipt of the order.

Calendar of Events for Online Proctor Based AIBTCET - 2024

(Admissions to B. Tech. Biotechnology /B. Tech. (Medical) Biotechnology / M. Tech. (Integrated) Biotechnology Programmes)

1	Test Fee	:	Rs.1000/-
2	Processing Fee	:	Rs.300/-
3	Last date for submitting the application form to- Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune for Online Proctor Based All India Biotechnology Common Entrance Test -2024 (AIBTCET-2024)	:	<ul style="list-style-type: none"> • Without late fee :12/04/2024 (Friday) Until 5.00 p.m. (Test Fee - Rs. 1000/-) (Total Fee Rs. 1300/-) • With late fee : 19/04/2024 (Friday) Until 5.00 p.m. (Total Fee Rs. 1250/-) (Total - Rs. 1550/-)
4	Admit cards to candidates who are considered provisionally eligible for Online Proctor Based AIBTCET - 2024	:	All the candidates who have submitted the online application form are required to download the Admit card online two weeks before the day of Online Proctor Based AIBTCET - 2024
5	Day, Date & Time of Online Proctor Based AIBTCET - 2024	:	Sunday, 21/04/2024 From 11.00 a.m. to 12.30 p.m.
6	Declaration of Result	:	Will be notified on the Vidyapeeth Website
7	Schedule of Counseling	:	Will be notified on the Vidyapeeth Website
8	Venue of admission sessions	:	Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Tathawade, Pune - 411 033
9	College to open on	:	Will be Displayed on Vidyapeeth Website
10	Fees Structure -	:	General Category
	B. Tech. Biotechnology		Rs. - 2,00,000 /-
	B.Tech. (Medical) Biotechnology		Rs. - 2,00,000 /-
	M.Tech. (Integrated) Biotechnology		Rs. - 2,00,000 /-
			NRI Category
			US \$ 2454
			US \$ 2454
			US \$ 2454

The Candidate submitting online application form should also pay processing & entrance fee through payment gateway.

Note - The Processing Fee and the Test Fee is non - refundable.

Results will be displayed on the Vidyapeeth website at www.dpu.edu.in. Results of individual candidate will not be communicated on telephone or by post.

***Note -**

DPU will provide the facility of downloading Admit Cards of All India Biotechnology Online Proctor Based Entrance Test on website: www.dpu.edu.in. Candidates are required to download the admit card from the website and follow the instructions given therein. Candidate may please note that admit cards will not be sent by the post.

The Admit Card will bear the candidate's Roll Number, Name, Father's Name, Photograph, Signature with Name of the candidate. The candidate should carefully examine the Admit Card downloaded by him/her for all the entries made therein.

Fee Structure

Particulars	General Category	NRI Category
Annual Fees	₹ 2,00,000/-	US \$2454

Note: Annual Fee includes Tuition Fee, Development Fee and Other Fee

The Annual fee shall be increased by 3% each year

The Annual Fees is to be paid by NEFT / RTGS / Demand Draft in favour of "The Director, Dr. D. Y. Patil Biotechnology & Bioinformatics Institute, Pune", payable at Pune by the student at the time of counseling and issue of admission letter.

Vidyapeeth Eligibility & Registration Fee (one-time Fee):

15% (Fifteen Percent) 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 favour of "The Registrar, Dr. D. Y. Patil Vidyapeeth, Pune" payable at Pune.

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

Hostel Accommodation & Fees for Academic Year 2024-25:

Hostel with Mess Facility are available.

Hostel Fees III Seater Non AC with mess will be notified on the Vidyapeeth Website: www.dpu.edu.in.

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.

Uniform Fees:

In addition to the above fees the student shall pay the Uniform Fee as prescribed by the Institute.

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 as per rules notified on the website.

Admission Procedure

1. General

(I) Admissions to all these courses shall be by an All India Biotechnology Online Proctor Based Common Entrance Text (AIBTCET-2024) 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-2024.

(iii) The admission sessions will be conducted through online counselling by the Dr. D. Y. Patil Biotechnology & Bioinformatics Institute, Tathawade, Pune - 411 033. Failure to report for admission on the scheduled date and time shall result in cancellation of the claim of the candidate to the seat.

(iv) Appearance at the AIBTCET-2024 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. 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 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 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.

2. Instructions for completing the Application Form

- 2.1 The name mentioned in the form by the candidate should be the same as in the documents of 10+2 examinations.
- 2.2 An incomplete application form and an application form which is not accompanied by processing and Entrance test fee (add Rs. 250/- for late submission) shall not be entertained and processed. This fee should not be sent by money order. Please note that the processing fee and entrance test fee is non-refundable.

3. Instructions for Applying Online

- 3.1 Visit <http://admissions.dpu.edu.in> to apply online.
- 3.2 Fill in your basic details and click on the Apply Now button.
- 3.3 You will have your dashboard open in front of you. Also welcome mail containing your login ID and password will be sent on your registered email ID. You can use these details to login later.
- 3.4 Fill the application form completely and upload all the required documents.
- 3.5 Make the fee payment online.
- 3.6 After completion of entire form with payment, click on 'Submit' button. Your admission form will get submitted.
- 3.7 After the successful payment of the fees, you will not be able to make any changes in the Application Form.
- 3.8 On the dashboard, two links for printing Receipt and Application Form will be available. Take printout of both the documents for your reference.
- 3.9 Link to print Admit Cards will be provided later and you will be intimated on your email ID and also through SMS on your given mobile number.
- 3.10 If you face any technical difficulty at any step while filling the application form, please mail us on the email ID provided on the dashboard of your login page.

4. Issue of Admit cards

- 4.1 All the candidates who have submitted the online application form, are required to download the Admit Card online two weeks before the day of Entrance Test. The admit card will indicate the seat number and the examination centre (with its address) allotted to the candidate.
- 4.2 The candidate shall not mutilate the admit card or change any entry made therein after it has been authenticated by the Vidyapeeth authorities.

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.

6. Merit List

- (i) The Vidyapeeth shall prepare a merit list of the candidates who appear for All India Biotechnology Online Proctor Based 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 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.

7. 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 **Calendar of Events** 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) The candidate shall remain present for on the spot admission, as per the schedule given in **Calendar of Events** 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 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 NEFT / RTGS / Demand Draft, drawn on a nationalized bank favoring '**The Director, Dr. D. Y. Patil Biotechnology & Bioinformatics Institute, Pune**', payable at Pune. The **Vidyapeeth Eligibility fee** shall be paid in similar manner favoring '**The Registrar, Dr. D. Y. Patil Vidyapeeth, 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.

8. 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. 2024 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.

9. 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.

10. 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. **As per UGC regulations mandatory affidavits should be submitted by all old and fresh students and parents / guardians on the UGC website - www.antiragging.in display the step by step guide on "How to fill an online anti ragging undertaking by the student and parent / guardian".**

11. 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 and his decision shall be final and binding on all the concerned.

12. Court Jurisdiction

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

13. 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).

Students Achievements

DPU Dr. D. Y. Patil Biotechnology and Bioinformatics Institute

Congratulations

To the students selected for the **MITACS Globalink Research Internship 2024**

Soumya Bhatia (BET 3rd year)	Anuradha Joshi (BET 4th year)	Priyanka Sonar (BET 3rd year)
Host academic institution: Balhassa University	Host academic institution: St. Francis Xavier University	Host academic institution: Toronto High Institute University

DPU Dr. D. Y. Patil Biotechnology and Bioinformatics Institute

Congratulations

To the M. Tech. (Int.) Biotechnology students selected for the **AICTE PG (GATE) Scholarship 2023-24**

Anuradha Joshi	Atharva Shinde	Soumya Shekhar	Shreyashi Dahiya

DPU Dr. D. Y. Patil Biotechnology and Bioinformatics Institute

Congratulations

Students selected for **Bilateral Exchange Program University of Skövde, Sweden**

For final year Dissertation project **AY 2023-24**

A Nishant Reddy (M. Tech. Integrated Biotechnology)	Hazel Suresh (M. Tech. Integrated Biotechnology)	Patil Shriyash (M. Tech. Integrated Biotechnology)

DPU Dr. D. Y. Patil Biotechnology and Bioinformatics Institute

Congratulations

Muskan Samudra (B.T. Bio. Biotechnology 2 nd Year)	Jishika Bhatia (B.T. Bio. Biotechnology 4 th Year)
1 st Prize - Solo Singing Competition organized by Sakal YEN (Young Engineers Network) Kalyan Maharashtra	Winner - Voice for BE Student (Western region)

Academic and Co-curricular Activity



GYTI Awards from President of India



Teachers Day Celebration 2023



Industrial visit to Aone Agrobiotech 2023



Social Outreach Activity 2023



World Environment Day 2023



Social Awareness and Donation Program 2023

Cultural Activity



Cytosoul 2023



Farewell Program 2023



Festival fete Cultural program 2023



Cytosoul 2023



Shivjayanti



DPU URJJA 2023



Annual sports ARCANE 2023

We are Proud of our Alumni (2022-2023) Campus Placements & Higher Studies



Ms. Muskaan Sharma

B. Tech. (Medical) Biotechnology (2019-2023) Masters Degree, University College Dublin, Ireland Biological and Biomedical Sciences (Negotiated Learning) 100% Scholarship on tuition fees



Mr. Akash Sawadatkar

B. Tech. Biotechnology (2019-23) Joint M.Tech / MCP-Ph.D. Programme 2023 IIT Kharagpur Biotechnology and Biochemical Engineering



Mr. Samayank Mukherjee

M.Tech. (Int.) Biotechnology (2018-23) PhD (Fellowship), State University of New York (SUNY) Downstate Health Sciences University, Brooklyn, New York, USA



Ms. Ketki Barve

M. Tech. (Int.) Biotechnology (2018-23) 'Associate Engineer' IZiel Healthcare



Ms. Manasvi Patil

B. Tech. Medical Biotechnology (2019-23) MS Admission & Sydney International Student Award University of Sydney, Australia Master's in Professional Engineering, Biomedical (Accelerated)



Ms. Eshu Kumari

M. Tech. (Int.) Biotechnology (2018-23) 'Associate Engineer'



Ms. Bini Biswas

B. Tech. (Medical) Biotechnology (2019-2023) Integrated Masters & Doctoral Program, (Scholarship) Kyungpook National University, South Korea, Biomedical Sciences



Mr. Vaibhav Jadhav

B. Tech. Biotechnology (2019-23) Trainee, Commissioning & Qualification DD Enterprises



Mr. Omkar Dhaygunde

B. Tech. Biotechnology (2019-23) Masters Admission at Johns Hopkins University, Maryland, USA, Masters program in Biotechnology BIODEFENSE



Ms. Anshika Tyagi

M. Tech. (Int.) Biotechnology (2018-23) MerilDiagnostics, Officer, R&D



Ms. Sakshi Taware

B. Tech. Biotechnology (2019-23) Erasmus Mundus Scholar, International Master of Science in Sustainable Drug Discovery, Ghent University, Belgium



Ms. Aditi Wangikar

B. Tech. (Medical) Biotechnology (2019-2023) Research Assistant PRADO Preclinical Research and Development Organization Pvt. Ltd.



Ms. Rutuja Bhamare

M. Tech. (Int.) Biotechnology (2018-23) PGP in MBA, Indian Institute of Management, Rohtak



Ms. Arya Jawade

B. Tech. Biotechnology (2019-23) Market Research Analyst, GRG Health Growman Research & Consulting Pvt. Ltd.



Mr. Saurabh Dey

B. Tech. Biotechnology (2019-23) The LIMES Institute University of Bonn, Germany, M. Sc. in Immunobiology



Mr. Narrayan Raam Sankar

B. Tech. (Medical) Biotechnology (2019-2023) M. Sc. Programme, Molecular Biomedicine University of Copenhagen, Denmark SU grants & financial support

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 its 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-planar 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 earth's 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 . Kepler'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 elastic 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; C_p , C_v - 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, Planck'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 gas molecules; 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 pressure, 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 a dipole, 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 Graaff 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 the 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 galvanometer, 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. Ferromagnetism 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 impedance & 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, lens 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 Fraunhofer 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 plane 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 Fraunhofer 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, Bohr's Postulates- expression for radius velocity, energy, wave number, spectral series of hydrogen, energy level diagram, explanation of ionization & excitation of energy, limitation of Bohr'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 energy per 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, Becquerel & Curie – artificial transmutation, artificial radioactivity, radio isotopes & mention their uses, brief account of Biological effects of radiation & safety measures.

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, Arrhenius 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 PCl_3 , PCl_5 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 $\text{K}_2\text{Cr}_2\text{O}_7$ and KMnO_4 .

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, electrophilic 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), monosaccharides (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 their role, Role of each ingredient and energetics .

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 from 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, silviculture, pathology, apiculture, microbiology, and bioinformatics. 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, carbohydrates, 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-chloroplast 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's

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, Addison'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 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; Adolescence, drug and alcohol abuse. Improvement in food production : Plant breeding, tissue culture, single cell protein, Biofortification, Apiculture 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 fragments, 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 from wild habitats. Ecological/social-for controlling soil-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 sacred species, sacred groves and sacred landscapes.

Biodiversity depletion-anthropocentric causes-urbanization, expansion of agriculture, 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 warming; 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*, *Phyllanthus 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)





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