

Departmental Profile (Botany)

Department	BOTANY		
Department Profile	SETH KESARIMAL PORWAL COLLEGE OF ARTS AND COMMERCE AND SCIENCE, KAMPTEE		
	<p>VISION OF THE COLLEGE</p> <ul style="list-style-type: none"> • Education for all. • Education as a means of eliminating poverty. • Education as a means of social inclusiveness and communal harmony. <p>MISSION OF THE COLLEGE</p> <ul style="list-style-type: none"> • To provide advanced quality education and knowledge to all especially to the deprived sections of society. • To cater to the all-round development of the students. • Including academic, sports and cultural development. • To develop a sense of community feeling among the students. • To develop social awareness and social commitment in the students. • To develop leadership and proactive qualities among the students so as to be competitive and successful in career building. 		
	<p>Departmental Goals/Amis/Objective</p> <p style="text-align: center;">DEPARTMENT OF BOTANY</p> <p>VISION To teach students with scientific temperament, and environmental awareness and to prepare them to face challenges in life.</p> <p>MISSION/GOALS To impart quality education in the field of plant science and to sensitize students to the need for conserving natural resources.</p> <p>The study of Botany is vital as plants are a fundamental part of life on earth. The curriculum for the B.Sc. Botany program has been designed with the aim of encouraging broad instructional goals and supporting the growing demands and challenging trends in the educational scenario. It targets providing an environment that encourages, promotes and stimulates the student's intellectual, professional and personal development. The curriculum caters to the all-round development of the student, preparing globally ready individuals for the fast pacing world. A three-year bachelor's degree program in Botany provides the foundation for prospective botanists to pursue a graduate-level education or find an entry-level career.</p> <p>OBJECTIVES The course introduces students to the importance of plants as an integral part of existence on the planet. It is imperative to internalize fully the fact that human existence depends on plants and hence, the necessity to conserve nature is the need of the hour. A few activities are conducted at the end of each semester which is relevant to the topics covered. Algal and lichen collection, mushroom cultivation, visits to tissue culture lab, plant collection trips, excursions, project works, group discussions, seminars, assignments, and maintenance of plant diversity on college campuses are a few of the activities. These activities enable the students to study the subject outside the classroom environment.</p>		
	<p>Introduction</p> <p style="text-align: center;">SUBJECT INTRODUCTION</p> <p>Botany is a subject moreover a tradition followed by almost all human beings knowingly or unknowingly. As a department closely related to nature, we give more importance to nature, its greenery as well as environmental health.</p> <p>The study of Botany, dealing with plant structure, function, classification and evolution, has inspired many great young minds. Plants are unique as solar energy converts and provide of energy for all heterotrophic organisms. It is fascinating to study the broad spectrum of reproductive processes in algae, fungi, lichen, plant pathology, bryophytes, gymnosperms and flowering plants.</p>		

	<p>A student of Botany has been learning these aspects together with taxonomy, anatomy, morphology, plant pathology, plant breeding, microbiology, plant physiology, plant biochemistry, ecology, cytology, genetics, cytogenetics, molecular biology and plant biotechnology. A new introduction of skilled-based courses like Biofertilizers, mushroom cultivation, soil science, floriculture, horticulture, Mineral nutrition with hydroponics, Pharmacognosy etc.</p>	
	<p>Brief History</p> <p style="text-align: center;">ABOUT THE DEPARTMENT</p> <p>Department of Botany was started in 1971 under the leadership of Dr. (Mrs.) Vishwanathan. Initially, the college had only preuniversity and B.Sc. I classes, from 1975 B.Sc. II classes were also started. Dr Vishwanathan resigned from the service in 1975 and Dr H. G. Jahagirdar took over the charge of the Department. During that period separate Botany lab was constructed on the first floor of the college building. Dr Jahagirdar left the college in December 1976 then Dr S.K. Podoley was appointed as Head of the Department. Subsequently, Dr Kalode also was appointed in 1980. The department ran successfully and carried out various minor research projects conducted by UGC till the year 2006. In 2007 Dr Kalode got retired due to superannuation of age while Dr Padoley retired from the service in May 2009. Dr Padoley presented Research papers in Japan and Germany and got the best paper presentation award in Japan. He was also nominated for the National Body of Environment. In 2009, Dr. (Mrs.) Jayshree Thaware joined the department as an Assistant Professor and Head from the 2009-2010 academic year. She looked after Department with few contributory teachers. In 2010 Dr (Mrs) Rashmi Jachak joined the department. In 2012, a major research project funded by University Grants Commission was granted to Dr Jayshree Thaware worth Rs.10, 01, 499/- and successfully submitted to UGC. Many research papers are published by both the present faculties in national and international journals of repute.</p>	
	Facilities	Scientific identification of Plants, Air samplers
	Departmental Achievements	<ul style="list-style-type: none"> • Submission and completion of Major Research Project by UGC • Departmental results always more than University results • Faculties Awarded by Best teacher award, Best Researcher award , best academician award and best poster presentation award • Participation of students in many co-curricular and extracurricular activities and winning prizes
	<p>Best Practices of the Department</p> <p>TITLE OF THE PRACTICE- Environmental Awareness and Green Practice</p> <p>GOAL- Create awareness about the importance of a balanced environment among students and staff and plan actions to save our environment in order to make our life safe and healthy. This practice has been effectively implemented for the stakeholders to implement the following objectives;</p> <p>OBJECTIVES OF THE PRACTICE-</p> <ul style="list-style-type: none"> • To create a peaceful environment on the college campus and increase green consciousness among students. • To conduct activities to support the environment. • To inculcate practical and humanitarian bend of mind among students that can prove a long-lasting impact on their future personal and professional life. <p>CONTEXT- The College has a large campus with rich biodiversity also supporting the cause of campus beautification. The major habitats on the campus include plantations, gardens, open spaces, sports grounds and buildings. The geographical area of the college supports the efforts put in by the management and the administration to run activities that support nature.</p> <p>OUTCOME OF THE PRACTICE-</p> <ul style="list-style-type: none"> • Tree plantation drives are organized regularly to create a clean and green campus. During 	

	<p>every academic year, the NCC and NSS wings of the college take up the program for planting saplings regularly.</p> <ul style="list-style-type: none"> • The college premises is filled with greenery which produces a soothing impact on hot summer days. By growing plants to make our atmosphere fresh and breathe green air. • A set-up of a to be a plant nursery will be experimented with by the Botany department in the next academic session. • Some saplings are grown which are donated by students and social organizations in the vicinity of the college. The college is richer with a large variety of medicinal plants and a wide variety of plant species. • There are varieties of plants in the whole premises of the college. The total number of large trees is 355 in number. Many annuals, herbs, shrubs and lignans are present. Altogether 100 different plant species are found on college premises. • All the science students are involved in the initiative taken by the Botany department and Environmental science students. Because of this, the interest of students in the plantation is raised. These initiatives exhibit institute efforts for environmental sustainability and inspire students to take up responsible steps for a better environment and better life. <p>EVIDENCE OF SUCCESS-All the activities and programs run by the institution are focused on students' sensibility towards the environment and nature. They are found actively participated in all the activities and behave more responsibly on campus. No trees and plants are hurt by any students. The collective efforts to maintain the campus clean and green are visible to any outside visitor. More plants are growing each year on the campus. Always giving green gifts- a plant –gift of life for all academicians and chief guests associated with college programs. The pieces of evidence of the practices can be seen in terms of a cleaner environment, bio-diversity maintained on campus, the plantations with rare plants as well common plants which are needed for day-to-day practical class work material. Problems Encountered and Resources Required Planning of different activities need continuous efforts of staff as well students. Maintenance of the college flora and other green zone like the kitchen garden of the home economics department is challenging as they need more human resources and funds. Moreover, animal hazards and other pathogenic activities are a challenge to surviving new plants and green leaves. Water scarcity is the main problem of the area in summer and the water resources are limited use.</p>
<p>Placement if any after PG too</p>	<ul style="list-style-type: none"> • Takshit Kadbe recruited in South Central Railways as Assistant Loco shed on Permanent basis posted at Hyderabad • Ms Purvayee Kadbe appointed at S.K.Porwal College as Laboratory Assistant on Permanent Basis. • Mr Yashwant Rathod was appointed at S.K.Porwal College as Laboratory Assistant on Permanent Basis. • Ms Smruti Murkute appointed as General labour in WCL, Nagpur Area, Nagpur.
<p>Departmental Awards</p>	<p>Dr Rashmi Jachak</p> <ol style="list-style-type: none"> 1) “Kalp- Young Academician Award” by Department of Biotechnology and Microbiology, Kalp Laboratories, Mathura. In 4 th National Annual Conference. 2) “Best Women Researcher Award” by Research Education by solutions Centurion university, Odisha.2022 3) “Best Academician Award” by International Journal for Innovative Engineering and Management Research. IJIEMR- Elsevier SSRN Research Award 2022
<p>Collaborations and MOU</p>	<p>Memorandum of Understanding-To Promote Academics and Research Interaction and Cooperation between Kamla Nehru College, Sakkardara, Nagpur and Seth Kesarimal Porwal College, Kamptee on 4th March 2020.</p>

Academic Courses / Programmes	<p>Programs B.Sc Group Available CBZ</p> <p style="text-align: center;">B.Sc. (BOTANY) PROGRAM SPECIFIC OUTCOME</p> <p>After successful completion of this course, the student will-</p> <ul style="list-style-type: none"> * Be able to cultivate Botanical observations (Flora) and nurture the interest. * Be able to communicate to lay audiences and arouse their interest in the beauty of nature i.e. environment and science. *Be able to explain the core ideas and techniques of Botany at the college level. *Be able to recognize the power of nature (Environment) and generalization in society. * Be able to carry out objectives analysis of the given class work material. *Be able to recognize the importance of studying Botany as basic science in this modern biotechnology *Be work independently able to collaborate effectively in teamwork * Be able to continuously enrich them through a lifelong journey. * Students can conceive the knowledge of General characteristics, nature and economic importance of viruses, bacteria, mycoplasma, algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms. * Be able to identify the angiosperm flora in nature up to the family level. <p style="text-align: center;">BOTANY SUBJECT (COURSE) OUTCOME</p> <p style="text-align: center;">B.Sc. SEMESTER-I</p> <p>B-1 Viruses, Prokaryotes, Algae and Biofertilizers B-2 fungi, Lichen, Plant Pathology, Bryophyta and Mushroom Cultivation</p> <p>Upon completion of this course, successful students will be able to</p> <ul style="list-style-type: none"> • Understand the living nature of Prokaryotes like viruses, mycoplasma, bacteria and Cyanobacteria. • They can conceive the knowledge of General characteristics and nature of viruses, Types, their multiplication and Economic importance. • Understand the structure, Properties and reproduction of Mycoplasma. • Learn about the bacteria, Algae, fungi and Bryophytes concerning their structure, reproduction and Economic Importance. • They can familiarize the symbiotic relationship of lichen and the Saprophytic and parasitic relationship of Fungi. • Find the relationship between Host and pathogen and disease control measures concerning diseases caused by viruses, bacteria and fungi. • Can understand the relationship of evolution from aquatic habitat to amphibian habitat of Bryophytes. • Conceive the concept of alteration of generation. • Can analyze the life cycles of bacteria, cyanobacteria, algae, fungi and bryophytes. • They got knowledge of handling the class work material in the laboratory and can find the relation between permanent slides of material and their sections. • To get acquainted with the role and importance of biofertilizers. • To know how to make Mass production of biofertilizers • Can understand the microbes associated with biofertilizers products and production. • Can identify and characterize Rhizobium, Azotobacter, PSB and Azolla- the biofertilizers. • To understand the technology of Mushroom cultivation • To know the nutritional and medicinal value of edible mushrooms and Poisonous mushrooms. <p style="text-align: center;">B.Sc. SEMESTER-II</p> <p>B-3 Palaeobotany, Pteridophytes, Gymnosperms and soil analysis B-4 Morphology of Angiosperms and Floriculture</p> <p>Upon completion of this course, successful students will be able to</p> <ul style="list-style-type: none"> • Understand the morphology and anatomy of first land plants meaning pteridophytes. • Learn the life histories of <i>Rhynia</i> a fossil plant, <i>Selaginella</i> and <i>Equisetum</i>. • Conceive the knowledge of the Alternation of generation and economic importance of
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pteridophytes.

- Understand Evolutionary development in land plants like apogamy, apospory, stellar development, heterospory and seed habit.
- Understand the concept of Phanerogams
- Learn about Evolutionary trends in Gymnosperms concerning its general characters and economic importance and alteration of generation.
- Introduced to new topic Palaeobotany i.e. fossil plants, fossilization theories, Geological time scale, types of fossils etc.
- Analyzed the difference between living plants and fossil plants.
- Understand the external structure i.e. morphology of Angiosperm.
- Familiarize with the Morphology of various Parts of plants i.e. root, stem, leaf, inflorescence, and flower.
- To know the composition of the soil.
- To understand the physical and chemical properties of soil.
- To get acquainted with the sampling of the soil.
- To know the commercial aspects of Floriculture
- To understand the methods of cultivation with reference to various parameters to increase the yield of the flowers
- To know various disease and their control measures associated with floral cultivation

B.Sc. SEMESTER-III

B-5 Angiosperm Systematics, Embryology and Indoor Gardening

B-6 Angiosperm Anatomy and Horticulture

Upon completion of this course, successful students will be able to

- Can relate to the difference between gymnosperms and angiosperms.
- Understand the phylogeny of angiosperms i.e. the origin of angiosperms.
- Can study the difference in fossil plants of angiosperms
- Familiarize the term Angiosperm Systematics and taxonomy, Principles of botanical nomenclature, classification, systems of classification and modern trends in taxonomy etc.
- Expand their knowledge by studying the different family members based on their gross morphology of dicots and monocots.
- Conceive the concepts of plant cell and cell organelles like Cell wall, cell membrane, nucleus, E.R., Golgi complex, vacuoles, ribosome, mitochondria and chloroplasts.
- Familiarize with the term Chromosomal organization, sex chromosomes in plants.
- Can learn the cell division methods i.e. mitosis and meiosis theoretically and practically.
- Define and analyze the term biostatistics.
- Find the relationship between plant breeding and evolution.
- To know the scope for landscaping and indoor gardening in various environments.
- To get acquainted with the various parameters to grow indoor plants.
- To study the various house plants.
- To study the Definition, Scope and importance of Horticulture
- Methods of propagation of various horticultural crops
- To get acquainted with various techniques of Bonsai preparation

B.Sc. SEMESTER-IV

B-7 Cell Biology, Plant Breeding, Evolution and Seed Technology

B-8 Genetics, Molecular Biology and Plant Nursery

Upon completion of this course, successful students will be able to

- Can understand the basic body plan and modular type of growth, different types of the meristem.
- Can study the permanent tissue and the difference between simple and complex tissue.
- Understand the anatomical differences in the primary and secondary structure of monocot and dicot root, stem and leaf.
- Can easily identify the anatomical differences and positions of vascular bundles, cambium, periderm, growth rings, sap and heartwood.
- Conceive the knowledge of the term senescence and abscission.
- Determine the differences between microsporogenesis and Megasporogenesis. * Analyze the terms double fertilization and triple fusion.
- Learn the laws of inheritance, interaction of genes, linkage of genes and chromosomes, crossing over and mutations.
- Can determine the structural changes in chromosomes.

- Learn about the structure of DNA and the concept of genes, DNA damage and repair.
- Can define and analyse the term genetic code, gene expression and regulation of gene interaction.
- To study the structure and types of various seeds.
- To understand the term seed dormancy and methods to break it.
- To know about seed testing and its certification
- To understand the term Commercial types of seeds
- To know the term plant nursery and the infrastructure required to raise it.
- To understand the planning and seasonal activities regarding plant nurseries.
- To understand how to do nursery management.

B.Sc. SEMESTER-V

B-9 Plant Physiology, Mineral Nutrition and Hydroponics

B-10 Plant Ecology and Organic Farming

Upon completion of this course, successful students will be able to

- Conceive the terms of carbohydrates, lipids, amino acids and enzymes.
- Understand the plant water relations and water conduction through the xylem and transport of material through the phloem.
- Find the relation of mineral nutrition.
- Learn the respiration phenomenon in plants and different physiological processes in respiration.
- Familiarize the term photosynthesis and the physiology behind the different cycles of photosynthesis
- Can understand nitrogen metabolism.
- Find relation in the terms of ecology and climate.
- Learning about Pedogenesis means soil formation, soil profile, and soil properties.
- Understand biotic and abiotic factors and biogeochemical cycles.
- Conceive the term Ecosystem.
- Learns Phytogeography.
- To understand Hydroponics.
- To learn about mineral nutrition.
- To understand micronutrients and macronutrients and their role and deficiency symptoms.
- To differentiate the advantages and disadvantages of hydroponics i.e. soil-less farming.
- To know the various methods for hydroponics cultivation.
- To get acquainted with the term Organic farming.
- To learn the methods of Preparation of Bio-compost and preparation of vermicompost and its type
- To understand the concept of organic manure.

B.Sc. SEMESTER-VI

B-11 Biochemistry, Biotechnology and Herbal technology

B-12 Phytogeography, Utilization of plants, Techniques and Pharmacognosy

Upon completion of this course, successful students will be able to

- Understand the growth concept, circadian rhythms and biological clock.
- Learn about the plant growth regulators and different tropic and Nastic movements of plants.
- Familiarize with the term Photoperiodism.
- Conceive the concept of seed dormancy and plant defence.
- Find the relation between plant relation and biotechnology.
- Analyze the term plant tissue culture i.e. Micropropagation.
- Determine the term genetic engineering.
- Learn about DNA libraries.
- Understand the meaning of transgenic plants.
- Determine the advantages and disadvantages of transgenic plants.
- Learn plant succession and different adaptations with suitable examples.
- Conceive the concept of environmental pollution and its types, control and environmental management.
- Evaluate the term natural resources.
- Find the relation between the principle and application of microscopy, electrophoresis, spectroscopy, chromatography etc.
- Understand the term utilization of plant with proper examples of food, oil, fibre, spices, beverages, medicinal and rubber plants.
- Conceive the concept of ethno botany.

	<ul style="list-style-type: none"> • To know the history and importance of herbal technology • To understand the basic concepts of drugs. • To learn the Cultivation, harvesting, processing, storage and utilization of some drug plants • To study some herbs used in cosmetics. • To get acquainted with the term Pharmacognosy • To understand the Definition and scope, of Drug adulteration its Types and methods of drug evaluation also biological testing of herbal drugs. • Biological source, staining, diagnosis, micro-chemical tests, chemical constituents, preparation and uses of drug extracted of some Pharmacognosy plants.
Faculties	<p>Dr Jayshree S. Thaware Associate Professor and Head</p> <p>Dr Rashmi A. Jachak Associate Professor</p> <p>Dr. Prajakta Bobde CHB Faculty</p> <p>Supporting staff Ms Purvayee Kadbe Laboratory Assistant</p> <p style="text-align: center;">FROM THE DESK OF THE HEAD OF THE DEPARTMENT</p> <p>Welcome Dear Students, Current thrust areas of teaching and research provide students with substantial exposure to a variety of subject areas in Botany. The discipline's studies include plant structure, growth and development, plant molecular biology, physiology and biochemistry, plant pathology, ecology, genetics, Systematics, evolution, bioinformatics and transgenic technology. Plant Systematics on a varied range of taxa ranging from algae, fungi and other microbes, bryophytes and vascular plants (ferns, gymnosperms and angiosperms including crop plants) at cellular, organism, community and ecosystem level. Our Botany department is unique because we provide innovative programs of excellence in research, education and public and professional guidance. It is a moment of great pleasure for me to make students opt for Botany as one of the subjects, so as to get benefitted from the research work that will ultimately help in the welfare of society. Department is committed to providing a positive educational experience for each student, an environment of personal growth and achievement. We aim to create an enabling environment where students thrive and gain comprehensive education and broadened scientific knowledge in order to equip them with skills that will benefit them in their future and professional ambitions. Our department has a distinguished record in both teaching and research. Teaching and research are inseparable components. In the department, both Faculty members have excellent academic credentials and are highly regarded. They have been conferred with many prestigious awards at national levels. Faculties of the department are known to be very approachable and happy to help students. For the all-round development of students, they are encouraged to participate in academic and extracurricular activities. Department also organizes laboratory visits, industrial visits, and botanical excursions from time to time which provides exposure and insight to students. Best of luck with your future endeavors...</p> <p style="text-align: right;">Dr Jayshree Thaware Associate Professor and Head Department of Botany</p>
	<p>Retired staff of the department with period and their contribution to the department</p> <p>Dr S.K.Padoley 1976-2009 Dr Kalode 1980-2007 Dr Padoley presented Research papers in Japan and Germany and got the best paper presentation award in Japan. He was also nominated for the National Body of Environment</p>

Research For each Teacher Separately

**Research Profile of Department
Dr Jayshree Thaware**

Sr . No.	Particulars	Total Number	University	State	National	International
1	Invited Person, Invited Talks, Lecturers, etc	02		01	01	
2	Papers presented in Conferences, Seminars, Workshops, Symposia	19	01	01	14	03
3	Full papers in Conference Proceedings	02			02	
4	Session Chaired in Conference/ Seminars	01			01	
5	Invited Members	01			01	
6	Participations in Seminars, Conferences and Workshops	51	09	06	26	10
7	Participations in Webinars	19	03	04	12	03
8	Paper Reviewed for the Research Journals	02			01	01
9	Organization of Seminars, Conferences, Workshops Completions	07	01	03	03	
10	Judge in Seminars	01	01			

Dr Rashmi Jachak

Sr . No.	Particulars	Total Number	University	National	International
1	Invited Person, Invited Talks, Lecturers, etc	03	03	01	
2	Papers presented in Conferences, Seminars, Workshops, Symposia	20		10	10
3	Full papers in Conference Proceedings	04		04	
4	Participations in Seminars, Conferences and Workshops	40		22	18
5	Participations in Webinars	06		06	

Minor Major Research Projects in Department Completed, Ongoing etc.	Sr. No	Project title	Sanctioning Authority	Amount Sanctioned	Duration	Status Completed / Ongoing
	1	Atmospheric survey of fungal spores in the Intramural and Extramural environment of Kamptee with respect to different heights Principal investigator- Dr Jayshree Thaware	University Grants Commission, New Delhi	Rs.10.01,499/-	3 years	Completed

Publications

	Journal Publications			Book Chapters Publications		
	State	National	International	State	National	International
Dr Jayshree Thaware	1	16	12	----	3	1
Dr Rashmi Jachak		10	17	2 books	1	2

Student Strengths

Year	Course			Eligibility	Link to syllabus
	Part I	Part II	Final		
2016-2017	74	50	27	XIIth State Board /CBSE board/ICSC board exam passed student	https://docs.google.com/document/d/1LLXNKt1Z12DF7dD-hAbFS2XJxkxmPWj/edit?usp=sharing&oid=116751022474316304094&rtpof=true&sd=true
2017-2018	70	63	24		
2018-2019	69	51	25		
2019-2020	66	49	26		
2020-2021	58	56	75		
2021-2022	47	51	56		
2022-2023	53	51	51		

Student Progression

Year	PG Diploma	PG Degree	Other Courses
2018-2019		4	1
2019-2020		4	
2020-2021		4	
2021-2022		5	2

Result Analysis for Department

Year	Number of Student Admitted in batch		Appeared in Final Year	Number in Final Years		Number of Students in final Year		Drop out ratio	College Result in Percentage
	First Year	Final year		Boys	Girls	Passed	Failed		
2016-2017	74	27	27	5	22	19	6	36%	76%
2017-2018	70	24	24	5	19	21	3	34%	87%
2018-2019	69	25	25	3	22	25	1	36%	96%
2019-2020	66	26	26	4	22	26	0	39%	100%
2020-2021	58	81	81			80	1	----	100%
2021-2022	47	56	54	11	43	54	2	-----	94%
2022-2023	51	51		13	38	-----	-----	----	-----

Faculties

	Name	Specialisation	Area of Research	Link to Profile
Head	Dr Jayshree Sandesh Thaware	Palynology and Aerobiology	Palynology and Aerobiology	https://docs.google.com/document/d/1ol8YQB8okW--62T_tHcC3-R7cRTzIiKr/edit?usp=sharing&oid=116751022474316304094&rtpof=true&sd=true
Faculties	Dr Rashmi Ajiet Jachak	Phycology	Biofertilizers and Metal Biotechnology	https://docs.google.com/document/d/1WoWkc0PIBNELDodqvzskk1MDF-84sfs4/edit?usp=sharing&oid=101003410069791821978&rtpof=true&sd=true
Ex-Head	Name	Duration		
	Dr (Mrs) Vishwanathan	1971-1975		
	Dr H.G. Jahagirdar	1975-1976		
	Dr S.K.Padoley	1976-2009		
Ex-Faculties	Dr Kalode	1980-2007		