University Admission Brochure

(2023-24)

for

Admissions to Ph.D.

MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY

(Formerly Madan Mohan Malaviya Engineering College, Gorakhpur, Estd. 1962**)**
(U.P. Govt. Technical University)

DEORIA ROAD, GORAKHPUR-273010 (UP)
Website: www.mmmut.ac.in
Email: phd.admission@mmmut.ac.in

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VICE CHANCELLOR'S MESSAGE

Prof. J. P. Saini

It gives me immense pleasure to announce that the Madan Mohan Malaviya University of TechnologyGorakhpur is commencing Ph.D. admissions for the Session 2023-2024 (Even Semester). Madan Mohan Malaviya University of Technology, Gorakhpur has been established in the year 2013 by the Government of Uttar Pradesh in the form of a non-affiliating, teaching and research University after reconstituting the Madan Mohan Malaviya Engineering College, Gorakhpur which was established in 1962. It has a more than 60-year-old legacy of excellence in education and technology development. Our vision at MMMUT is to facilitate and promote studies, research, technology incubation, product innovation and extension work in Science, Technology and Management Education, and also to achieve excellence in higher technical education. We nurture the young and talented brains of our students to make them successful professional, strong leaders and thoughtful visionaries. The comprehensuive curricula of our university are designed with an international perspective giving multiple opportunities to the students for their holistic development. The diverse extra-curricular activities and the various student societies make learning a great experience for our students. We are focused and committed towards empowering our students with the knowledge and skills that let them open their wings and fly high. The vast group of recruiters visiting our campus and the placement statistics of our university highlight the careful technological and comprehensive grooming that our students receive during their stay at MMMUT.

I would like to assure you that becoming a part of the MMMUT student fraternity will help you shape your academic future in a very fruitful way. I hope that this PhD admission brochure shall provide all the needful information about PhD admission procedures, and other related academic activities. I send my best wishes to the candidates applying for admissions to the Madan Mohan Malaviya University of Technology Gorakhpur, UP.

Important Dates:

S.N.	Event	Tentative Dates*	Contact Email Id
1	Commencement of online application	09.1.2024, 08:00 AM	phd.admission@mmmut.ac.in
2	Last date for applying through online portal	23.1.2024, 11:55 PM	
3	Issue of Admit Card after Preliminary Screening (Done by the respective departments w.r.t. eligibility criteria and Qualifying degree)	Through MMMUT Portal	
5	Ph.D. written test. The written test will be conducted by the respective department in offline mode for all the elegible candidates	27.1.2024 Three hours Entrance Exam based on Research Aptitude/Methodology + Subject specific syllabus (50MCQs each). (Actual date/time shall be communicated through university website)	Respective Department
6	Display of list of **eligible** Ph.D. candidates who are eligible for Interview	27.1.2024	Respective Department
7	Verification of original documents (w.r.t. eligibility criteria and Qualifying degree) before Interview (Concerned Departmental	28.1.2024 (On the date of the interview)	Respective Department

	committee)		
8	**Eligible** Ph.D. candidates' interviews (Concerned Departmental committee)	28.1.2024	Respective Department
***The above dates are tentative, and candidates are advised to regularly visit the University website for any updates.**			

1 About the University

Madan Mohan Malaviya University of Technology, Gorakhpur has been established in year 2013 by the Government of Uttar Pradesh in the form of a non-affiliating, teaching and research University after reconstituting the Madan Mohan Malaviya Engineering College, Gorakhpur which was established in 1962. Fifty-seven batches of students have entered its portals to emerge after four years of rigorous education under the tutelage of some of the most venerable teachers, engineers ready to face the world and create new worlds. The University has a lush green campus that spreads over a vast area of 354 acres. As you enter its gate, the first sight that greets you is the color green. Malaviya's wooded acreages, a mere seven kilo meters away from the holy city of Gorakhpur, provide the perfect element for the perfect engineer. The University is located in the Gorakhpur -Deoria road about 9 km away from Gorakhpur Railway Station. The University has total 13 departments offering various Programs as per the following details:

1.1 Department of Civil Engineering

BTech (Civil Engineering)
MTech (Hill Area Development Engineering)
MTech (Environmental Engineering)
MTech (Earthquake Engineering and Seismic Design)
MTech (Structural Engineering)
PhD

1.2 Department of Computer Science & Engineering

BTech (Computer Science & Engineering)
MTech (Computer Science & Engineering)
PhD

1.3 Department of Information Technology & Computer Application

BTech (Information Technology)
MTech (Information Technology)
MCA
PhD

1.4 Department of Electrical Engineering

BTech (Electrical Engineering)
MTech (Power Electronics and Drives)
MTech (Control and Instrumentation)
PhD

1.5 Department of Electronics & Communication Engineering

BTech (Electronics & Communication Engineering)
MTech (Nanoelectronics and VLSI) #
MTech (Wireless and Optical Communication) #
PhD

1.6 Department of Mechanical Engineering

BTech (Mechanical Engineering)
MTech (Energy Technology and Management)
MTech (Computer Integrated Manufacturing)
PhD

1.7 Department of Chemical Engineering

BTech (Chemical Engineering)
PhD

1.8 Department of Pharmaceutical Science & Technology

B. Pharma

1.9 Department of Humanities & Social Sciences

PhD (Economics)
PhD (Psychology)
PhD (English)

1.10 Department of Physics & Material Science

MSc (Physics)
PhD

1.11 Department of Mathematics & Scientific Computing

MSc (Mathematics)
PhD

1.12 Department of Chemistry & Environmental Science

MSc (Chemistry)
PhD

1.13 Department of Management Studies

BBA
MBA
PhD (MBA)

Vision

To facilitate and promote studies, research, technology incubation, product innovation and extension work in Science, Technology and Management Education, and also to achieve excellence in higher technical education.

Mission

The distinctive mission of the University is:

- To serve society as a center of higher learning, providing long-term societal benefits through transmitting advanced knowledge, discovering new knowledge and functioning as an active working repository of organized knowledge.
- To take leadership role by providing need-based programs in engineering and technology, applied sciences, management, humanities, architecture, pharmacy, retail and fashion design, mass-communication, agriculture and other employable Programs in emerging areas.
- To promote compassionate care of the highest quality that translates new knowledge into meaningful improvements in technological outcomes through interdisciplinary collaboration, fiscal responsibility, support of diversity, a focus on quality and a culture of professionalism.
- To establish value creating networks and foster relationship with other leading institutes of higher learning and research, alumni and industries in order to provide significant contribution to national and international development.
- To create an intellectually stimulating Infrastructure and conducive environment for technology research, scholarship, creativity, innovation, entrepreneurship, and professional activity for service to community and economy.

2. About the Ph.D. Program and Research Vacancies

2.1 Research Vacancies: -

For the session 2023-24 (Even Semester), the maximum number of seats for admission to Ph.D. program offered by different departments is as mentioned below:

S. N	Program (Department)	Available seats in 1st Year	
		Research Scholars with University Fellowship	Research Scholars without University Fellowship (Sponsored/Self Financed)
1.	Ph.D. (Civil Engineering)	4	8
2.	Ph.D. (Information Technology and Computer Applications)	4	4
3.	Ph.D. (Electronics and Communication Engineering)	0	2
4.	Ph.D. (Electrical Engineering)	3	6
5.	Ph.D. (Mechanical Engineering)	3	2
6.	Ph.D. (Chemical Engineering)	4	4
7.	Ph.D. (Physics & Material Science)	2	2
8.	Ph.D. (Mathematics& Scientific Computing)	2	1
9.	Ph.D. (Management Studies)	0	3
10.	Ph.D. (Humanities & Social Sciences)-English	1	1
	Total	23	33
	Total available seats in 1st Year	56*	

*Seats of Ph.D. program stated above in different departments may increase or decrease.

Note:

- For Admission to Ph.D. Program, the reservation rules prescribed by Uttar Pradesh Government shall be followed strictly.
- In case of non-availability of reserved category candidates in PhD, the seat will be filled by unreserved category candidates.
- University reserves the right to change the number of seats. Refer to the Research Profile of departments for maximum possible seats allocated to various departments. Refer to the university website (www.mmmut.ac.in) for latest Ph.D. Regulations.

3. Ph.D. Admissions

3.1 Eligibility for Admission in PhD

a) Engineering/Technology:

An applicant possessing master's degrees in Engineering/Technology in the relevant discipline with a first class 60% or equivalent Cumulative Grade Point Average (CGPA) shall be eligible to apply for admission to Ph.D. programme of the University in Engineering/Technology.

b) Sciences/Humanities/Social Sciences/Management:

Candidates who possess the master's degree with 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed in respective discipline of Sciences/Humanities/Social Sciences/Management shall be eligible to apply for admission to Ph.D. programme of the University in Sciences/Humanities/Social Sciences/Management streams.

c) Direct Ph.D. Program (Full Time)

i. The candidates who have completed their final year (eighth semester) of their Bachelor's degree program (or result awaited) and have a minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed, shall be eligible to apply for direct Ph.D. admission. Such candidates shall be required to follow the regular Ph.D. admission procedure of the University.

ii. Candidates with MCA degree shall be considered equivalent to four years Bachelor's degree program for admission in Ph.D. and the eligibility shall be as per the details given in clause 3.1 c i. Such candidates shall be required to follow the regular Ph.D. admission procedure of the University.

Note:

A relaxation of 5% marks or its equivalent grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/ Differently Abled, Economically Weaker Section (EWS) as per UGC Gazette notification CG-DL-E-07112022-240086 dated November 7, 2022.

3.1.1 Broad Areas of Ph.D.

S.N.	Department	Broad Areas for Ph.D.
1.	Civil Engineering	Geotechnical engineering, environmental engineering, transportation engineering, hydraulics engineering and fluvial hydraulics, remote sensing
2.	Computer Sc. and Engineering	Theoretical computer science, computer networks and distributed systems, network security, database and information systems, artificial intelligence, image understanding, computer hardware and architecture, big data and machine learning, sensor networks, virtualization, and cloud computing.
3.	Information Technology and Computer Application	Network security, Computer Networks, database and information systems, natural language processing, software engineering, computer vision and image understanding, big data and machine learning, sensor networks, Mobile and cloud computing
4.	Electrical Engineering	Electrical measurement & instrumentation, control systems, electrical power systems, power electronics, electrical machines and drives, renewable energy system.

5.	Electronics and Comm. Engineering	Microelectronics/VLSI/Micro-strip antenna and filter design, organic electronics, solid state devices, non-conventional material-based devices & circuits, optoelectronics & photonics, wireless communication, nanoelectronics, optical communication and beyond the CMOS devices
6.	Mechanical Engineering	Design, manufacturing, Thermal, composites, computational mechanics, Production
7.	Chemical Engineering	Process intensification, advanced oxidation processes, nano-particle synthesis and applications, new and renewable energy, microbial fuel cell, cavitation engineering, energy and environment, biochemical engineering, water disinfection, fuels from sustainable feedstock
8.	Physics & Material Science	Condensed matter physics (theory and experimental), particle physics, molecular dynamics, amorphous semiconductors, thin films growth and characterization, optoelectronics, synthesis and characterization of nanomaterials & nanofluids, solar cells, Energy storage materials & devices, computational nanoionics and sensors.
9.	Chemistry & Environmental Science	Design and synthesis of carbon allotrope-based photocatalyst- for converting CO2 into useful forms based on natural photosynthesis. Rational design and Synthesis of 3D and 2D photocatalyst for C-H activation and sulfoxidation in presence and absence of carbon dioxide.
10.	Mathematics & Scientific Computing	Operations Research, Inventory Control, Optimization, Mathematical Modelling, Cryptography.
11.	Management Studies	General Management, Marketing, Organizational Behaviour
12.	Humanities & Management Science-English	Literature; Literary Theories: Traditional, Modern & Post Modern; Linguistics, Translation Studies; Literary Research Methods; ELT &SLT: Bilingual Method & Second Language; ICT in ELT, World Literature & Comparative Studies, Soft Skills & Communication Studies; Kinesics; Film Studies & Text Screen Inter-phase.
13.	Humanities & Management Science-Economics	Finance, Marketing, Development Economics, Managerial Economics. Industrial Economics.
14.	Humanities & Management Science-Psychology	Social Psychology, Cultural Psychology, Health Psychology, Positive Psychology, Organizational Behaviour, Organizational Culture

3.2 Mode of Admission

3.2.1 **Full time Research Scholar with University Fellowship:** A research scholar in this category works full-time for his/her Ph.D. He/she will be eligible to receive assistantship/scholarship from the University. Such regular Ph.D. candidates will share limited teaching load in his/her respective department subject to the terms and conditions prescribed by the University under this scheme. All such candidates will have to appear in the entrance test and followed by interview organized by the Department.

3.2.2 **Self-financed:** Self-financed research scholars will support themselves. University will not provide scholarship to such candidates. Under this scheme the University may admit students who qualify from fellowship/scholarship in sponsoring agencies based on an interview. The University may also admit its PG pursuing students well in advance to Ph.D. program if they have qualified above national level test for the purpose of award of scholarship.

Working Self-employed / non-working candidates can pursue PhD programme under self-financed category without getting any financial assistantship from the university. The final admission to the candidates under this category is based on the performance in the written test and/or interview conducted by the concerned department.

The staff members working as a full time JRF/SRF/RA etc. in sponsored research projects funded by the various central/state/other funding agencies to the faculty of the University as Principal investigator (PI)/Coordinator shall be eligible for the admission to Ph.D. programme in this category. They can be admitted by the due permission of the PI and Co- PI (if any) as well as Dean Research & Development and Professional Practices after joining the sponsored research project provided his/her Ph.D. topic is broadly related to the domain of sponsored research project. They are eligible to be admitted in Ph.D. program only if they possess either valid score card of national level examination such as GATE, NET etc. or have been found eligible in the Entrance Test conducted by the department for the admission in Ph.D. program. If the project gets completed before the student completes her/his Ph.D., the candidature of research scholar remains unaffected. Such candidates can request for conversion of his/her category to "Full time Research Scholar with University Fellowship" if he/she has published received final acceptance for at least one SCI/SCIE indexed journal paper (minimum impact factor 2) from his/her research work. However, final approval for such conversion will be given by Research Council only.

3.2.3 **Sponsored:** A research scholar in this category is sponsored by a recognized R&D organization, Academic Institution, Government Organization, or Industry for doing Ph.D. in the University on a full-time basis. The University shall not provide any assistantship/ scholarship to such research scholar and the applicable University fees and expenditure on pursuing research work shall be remitted by the sponsoring organization to the University. Research scholars under this scheme shall be treated as full-time research scholars. All such candidates will have to appear in the entrance test and followed by interview organized by the Department.

Ph.D. progrms offered by the university are as follows:

3.3 Reservation/Relaxation

3.3.1. A relaxation of 5% marks or its equivalent grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/ Differently Abled, Economically Weaker Section (EWS) as per UGC Gazette notification CG-DL-E-07112022-240086 dated November 7, 2022.

3.3.2. A relaxation of 5 % marks will be allowed in the entrance examination for the candidates belonging to SC/ST/OBC/differently abled category, Economically Weaker Section (EWS), and other categories of candidates as per the decision of the Commission from time to time.

3.3.3. The reservation policy as prescribed by U.P. State Government or its directions regarding admission from time to time shall be adhered in the admission.

S.N.	Category	Percentage of Reservation
(a)	Scheduled Caste of U.P.	21%
(b)	Scheduled Tribe of U.P.	2%
(c)	Other Backward Classes of U.P.	27%
(d)	Economically Weaker Section of U.P.	10%

3.3.4. Reservation shall be applicable at the University level.

3.3.5 The medical standards prescribed are as given below:

Medical Standards Applicable:

Height	Candidate should be Physically fit to pursue his/her studies in the opted Program.
Weight	
Chest measurement	
Heart and lungs	No abnormality
Hernia, hydrocele, piles etc.	Presence of any of these is to be essentially corrected before joining.
Vision	Normal. If defective, it must be got corrected to 6/9 in the better eye and 6/12 in the worse one. Eyes should be free from congenital or any other disease.
Hearing	Normal. If defective, it must be got corrected before joining.
Physically handicapped/ disabled	The candidate having any one type of physical handicap/ disability given below.

Physically Handicapped/Disabled:

Type – I	Minimum 40% Permanent Visual Impairment
Type – II	Minimum 40% Permanent Locomotors Disability
Type – III	Minimum 40% Permanent Speech and Hearing Impairment

3.4 Selection Procedure for Admission

3.4.1. Admission to the Ph.D. programme will be done twice in a year, i.e., January and July. The online application will be available during the months of November and May every year for admitting the candidates in the two sessions.

3.4.2. Admission to Ph.D. program will be made through a written test and interview. The written test shall consist of 100 marks. 50% questions will be based on Research Methodology comprising quantitative methods/computer applications, experimental techniques etc. and 50% questions will be subject specific. The test shall be of three hours. Syllabus for Research Methodology will be common to all departments and domain specific syllabus will be prepared by each department. The admission brochure will contain the detail syllabus for written test.

3.4.3. PhD written test will be of objective type. The candidates are required to select suitable section in written paper for appearing in the written test as per their eligibility.

(i). Every objective type question would carry **one marks** for correct answer.

(ii). Each objective type of question will have one correct answer. The answer would be considered correct only if the appropriate choice is indicated in the answer.

(iii). There will be **no negative marking for wrong answer**. Zero marks will be awarded for unanswered questions.

(iv). Answers are to be marked using ball point pen (black/blue) only.

(v). All notifications in connection with PhD Admission-2024 (January) shall be made available on the University's official website www.mmmut.ac.in. It is the responsibility of the candidate to visit the website and be informed about all information relevant to him/her. Therefore, the candidates are advised to refer to this website regularly failing which University will not be responsible for any loss due to lack of communication.

(vi). Candidates securing 50% or above of the average marks of the top 5 candidates shall be eligible to be called for the interview.

(vii). The weightage of marks in the entrance test and interview will be in the ratio of 70% and 30%, respectively, for preparing the merit in a particular department.

(viii). The eligible candidates will be admitted in a particular department on the basis of cumulative merit (both test and interview), and as per the availability of faculty members in the particular department.

3.4.4. Exemption from written test

(i). Vice Chancellor may accord exemption from written test to the Academic/Non-Teaching staff of the MMMUT/Govt. of Uttar Pradesh, Public Sector Undertaking, or an industry of high repute etc. considering the merit of each case. Such candidates shall have an experience of 15 years.

(ii). Foreign nationals/ OCI fulfilling the eligibility criteria may be registered for Ph.D. programme. Foreign nationals/OCI shall be exempted from the written test but must appear in the interview in online/physical mode. They may be admitted based on their performance at the interview. The medium of instructions shall be English only. The admission of foreign nationals/OCI shall be subject to the verification of equivalence of their qualifying degrees from the Association of Indian Universities.

3.4.5. If, at any time after admission, it is found that a research scholar has not fulfilled all the requirements stipulated in the offer of admission or has committed some fraudulent act at any stage then the University reserves the right to revoke the admission of the research scholar.

3.5 Financial Assistance / University Fellowship

3.5.1 The University offers University Research Fellowships (URF) for a duration of 3 years. The monthly University Research Fellowships (URF) fellowship amount is of Rs 12,500/- .

3.5.2 The admission to the programme and award of fellowship are not linked. Admission to any programme does not guarantee the award of fellowship. Those who are not awarded fellowships can continue with the programme as self-financing Scholars.

3.5.3 In addition to the research work, all the University Research Fellows of the University shall have to undertake Teaching assignments /Practical classes/Tutorials to an extent of 6-8 hours per week and shall also be assigned other duties like checking of assignments, invigilation duties, etc. as prescribed from time to time.

3.6 Fee Structure

Fee Structure of Ph.D. Full Time Students (Research Scholar with University Fellowship/ Self-financed/ Sponsored) admitted in Session 2023-24 (Even sem.) is given as below:

Sr	Program	Year	For Hostlers #	For Non-Hostlers *
1.	Ph.D.	I Year	Rs 85,600/-	Rs 61,300/-

Inclusive of refundable Rs. 10,000/- against "University and Hostel Caution Money"
*Inclusive of refundable Rs. 5,000/- against "University Caution Money"
Note: In case of non-availability of hostel, the hostel fee component as applicable shall be refunded to the candidate. The above structure may be revised by the University/UP Government directives from time to time.

3.7 Procedure for Online Application

The candidate must submit his/her application for Ph.D. Admission 2023-24 (January Session) through "On-line application mode- Samarth Portal" only as per the details prescribed in the Admission Brochure.

Instructions for filling PhD Online Applications Form

- Separate application forms should be filled for Ph.D. programme for each Department.
- Filling false information will lead to rejection of application/cancellation of admission at any stage/time.
- Applications of candidates, whose results of qualifying examination (B.TECH/M.TECH, as applicable), is likely to be declared on or before last date given in this information brochure, will also be accepted. However, the Screening committee/Interview committee shall obtain an undertaking from the candidate, stating that his/her admission shall stand canceled if he/she fails to satisfy the eligibility criteria after declaration of result/admission.

Following Steps are given below:

Step#	Steps	Description of Steps
1.	Open Applicant Registration Page	The candidate should fill up the On-line application form any place through Internet by login on to **https://mmmutadm.samarth.edu.in** from **09 January 2024 (08.00 AM) till 23 January 2024 (11.55 PM)** as per the detailed procedure given on the website.
2.	New Registration	Applicant must create an account by clicking on **New Registration Button** and filling **Registration form** followed by verification of email.

<table>
<tr><td></td><td></td><td>Note: Please remember Email Id. OTP is sent to your Registered Email Id for verification purpose.</td></tr>
<tr><td>3.</td><td>Login</td><td>Applicant must enter Registered Email ID and Password to login to view dashboard. Three Steps are there to complete your form.
<table>
<tr><th>STEP 1</th><th>STEP 2</th><th>STEP 3</th></tr>
<tr><td>Complete Profile</td><td>Apply In Programme</td><td>Pay Registration Fees & Submit the Application</td></tr>
</table></td></tr>
<tr><td>4.</td><td>Profile</td><td>Applicant must create his profile (by clicking on Profile Button) carefully by filling all the required information. Please note that no modification shall be allowed after final submission of profile.</td></tr>
<tr><td>5.</td><td>Select Programme</td><td>Applicant must carefully fill information required in following sections (by clicking on Select Programme Button):
Programme Selection
Personal Details
Academic Details
NET/Equivalent Details
Experience details
Other Details
Uploads
Preview
Payments (Applicant must pay the registration fee (by clicking on Payment Gateway Button at bottom) to finally submit the application form and note down Order number/Transaction ID etc. mandatorily while making payment) after verifying all details by checking all confirmation checkboxes as per filled information</td></tr>
<tr><td>6.</td><td>Payments</td><td>The candidate has to deposit the application fee (Rs. 2500/- for General & OBC candidates and Rs. 1250/- for SC/ST/Female candidates) online as per the provisions made in online form. The application fee is non-refundable. The candidate is required to fill separate application form for each programs.
The online fee payment can be made through available online mode only. Additional bank charges will be applicable as per the rules of the respective bank depending upon the transaction mode used and are to be paid by the candidates themselves. The confirmation page will be generated only after making the online fee payment successfully.
In case the fee amount has been debited from candidate’s bank account and On-line application website does not acknowledge any fee payment then the candidate should make the payment again till it is not reflected on the University’s On-line application website. Candidate should contact the concerned bank for the difficulty faced by him/her. University will not be responsible for any inconvenience caused due to this. No extra time shall be permissible for any such failure.
Applicants must download Print registration Slip (by clicking on Payments Button).</td></tr>
<tr><td>7.</td><td>Print Form</td><td>On completion of the online application form, the candidates are requested to take the print of the application form and preserve it for future use as they shall submit the duly signed copy of application form at the time of document verification.</td></tr>
</table>

		Please note that don't send the had copy of Application form to University.
8.	Download Admit Card	Eligible Applicant can download their admit card from same dashboard.
9.	Support E-Mail	phd.admission@mmmut.ac.in

3.8 Refund of Fee:

(i). Processing/application fee is non-refundable.

(ii). The number of fees/other charges deposited by the students may not be refunded if the candidates do not join the programme or leave the University and intimate the same after the last date of admission. If a student cancels his/her dmission, only caution money shall be refunded.

3.9 Important Instructions:

i. Admission in PhD is open to the candidates who have passed the qualifying examination from any institution located in U.P. or whose parents are domicile of U.P subject to the eligibility conditions.

ii. For admission to PhD program, the candidates, who have passed the qualifying examination from an institution located outside U.P. and whose parents are NOT domicile of U.P. are also eligible for admission to PhD Programs offered in the University only under General (OPEN) category.

iii. Accepting admission in the University implies acceptance by the candidate and his/her parents or guardians, of all the provisions given in this admission brochure and the University rules as applicable. Any change in the rules, regulations, fees, and special conditions, etc. of the University shall mutatis mutandis apply to the admitted candidate.

iv. Candidates seeking advantage of reserved categories are required to indicate the same but not to enclose any supporting certificates with the application form. The advantage of horizontal reservation is not admissible to the candidate's seeking admission to PhD. These certificates will have to be produced in original at the time of document verification along with one attested copy of each one of them. The proforma of certificates are given at the end of this admission brochure at Appendix-A. Candidates are essentially required to produce the respective certificates in support of their claim for reservation on prescribed format only. Any deviation unless approved by the University in the proforma will deprive the candidate from the benefit being claimed. Note that the Certificate for OBC candidates will be valid only when it is issued on or after 01.04.2023 (mandatory due to conditions of creamy layer for OBC).

v. Proforma of various certificates is available in Appendix-A. In case of the online category/reservation certificates, the advantage of the reserved category shall be provided subject to their online validation through respective statutory website, failing which such candidate will not be entitled for the advantage of reserve category and they will be treated in general category. In case of the candidates who do not submit the proper category/reservation certificate in the prescribed proforma at the time of document verification, the advantage of reserved category shall not be provided to them, and they will be treated in General Category.

vi. If any document/declaration submitted by the candidate is found to be false at any stage, his/her candidature for admission shall be cancelled and he/she will be liable for prosecution under the law. In case of any legal dispute regarding admission, the jurisdiction will be limited to Gorakhpur courts only.

vii. In case the equivalence between the percentage of marks and Cumulative Grade Point Average is not defined by the University from where the candidate has obtained the qualifying degree then the most recent University Grants Commission/All India Council for Technical Education equivalence criteria shall be applicable.

viii. There shall be no age limit for admission to Ph.D. programme of the University.

ix. A full-time research scholar residential requirement shall be from the first registration till the final submission of the thesis. However, the minimum residential requirement for research scholar under full time category is two years or till successful completion of the course work and comprehensive examination whichever is earlier.

x. For any queries regarding admission, the contact number 8765783744 may be used from 10.00 am to 4.30 pm only on all days except gazetted holidays, Sundays and from 10.00 am to 1.00 pm on Saturdays. For the queries through e-mail (phd.admission@mmmut.ac.in), the reply will be made after 24 hours.

xi. The date of reporting for the newly admitted students shall be notified on university website and shall also be informed to the candidate in the admission offer letter during the counseling.

3.10 Original documents with one set of photocopies required at the time of Interview

Candidate is required to bring one set of photocopies of the following (along with downloaded PhD application form) which the candate has uploaded on the portal during online submission at time of interview.

i.	10th Mark sheets and certificate (Showing Date of Birth)
ii.	12th Mark sheets and certificate
iii.	B. Tech./UG (Mark sheets and degree certificates)
iv.	M. Tech./PG (Mark sheets and degree certificates)
v.	CGPA Conversion certificate as applicable
vi.	ID card uploaded on Samarth Portal
vii.	Passport Size Color Photograph (6 copies)
viii.	Experience certificate as applicable
ix.	Migration Certificate from last attended University
x.	All the relevant category certificates as applicable
xi.	Valid UGC-NET/UGC- CSIR NET/GATE/CEED and similar National level tests cetiificate as applicable
xii.	Sponshership Certificate from current Employer (Applicable to all the candidates who are currently employed)
xiii.	Online PhD Application Form
xiv.	Admit card

4. Amenities on the Campus:

i.	Lecture theater	University has many Smart Lecture Halls with a seating capacity of 100 each, and a Multipurpose Hall with 270 audience seating capacity. These lecture halls have been equipped with audio/video system.
ii.	Information Technology Resource Centre (ITRC)	Information Technology Resource Centre (ITRC) was established in 2005 under world bank programme (TEQIP-I) and is unique of its kind among all state engineering universities/colleges of Uttar Pradesh. The objective of the centre is to provide the central computing resources under one roof to students, faculty, and staff with a vision to support and strengthen the teaching-learning process and research. The local area network spread in almost entire campus is being managed from this centre. It remains open for 24 hours and is equipped with advanced computer networking hardware and software tools. Having around 250 computers arranged in its different labs, it provides uninterrupted highspeed internet connectivity to the entire campus with two leased line connections- 1 Gbps (1:1) NKN and 155 Mbps (1:1) BSNL leased lines. **Facilities available at/through ITRC-** • One High End Rack with 3 Blade Servers & One Advanced High-End Rack (equipped with power backup and cooling facility) with 2 Advance Servers. • Power backup with 09 no. of 10 KVA UPS, 2 no. 20 KVA UPS, Two 5 KVA UPS and one 10 KVA generator. • Various design and training software tools for students and faculty members • Four general computing labs namely Computing Lab 1, 2, 3 and 4 with total 150 no. of computers for UG students. • Two PG Lab. exclusively for PG. students with 82 computers. • Provides internet connectivity through OFC (of about 5 kms) to academic buildings, hostels and faculty/staff residences thus covering almost entire campus. • Manages Security system through CCTV Cameras installed at prime locations of the University. • Gbps (1:1) NKN and 155 Mbps (1:1) BSNL leased lines for Campus Wide Network connecting all departments/ Labs/ Admin Block/ Hostels/ Faculty Residences (About 1500 Access Points) • Wi-Fi facility in academic buildings in the Campus. The efforts are underway to provide Wi-Fi Internet facility in the entire campus. • The complete old CWN Network of the University is upgraded with some new Network devices and Equipment to provide smooth and fast connectivity to access Internet. • Two Seminar Halls with Virtual Class Facility namely Aryabhatt Hall (with Capacity of 200 Seats) and KarmakarHall with capacity of 90 Seats). • Biometric devices have been installed at various departments/sections of the University to take the biometric attendance of employees and PG/Research students. • E-Mail system (with mmmut.ac.in domain) for faculty/Staff and students.

		• Digital Gate Pass facility. **Network Infrastructure** For successful operation of Intranet/Internet with Wi-Fi facility in the University Campus, the details of network infrastructure are as under: • 1 Gbps Leased Line through NKN, 155 Mbps (1:1) Leased Line through BSNL (Backup); Both • leased line is running parallel to maintain the Internet Connectivity • 1 Main Core Switch layer-3 for management of Distribution/Access Switches • 1 No. SOPHOS Firewall for maintaining Internet Security of 2500 Users • Two Controller for accessing the Access Points (Wi-Fi Connectivity) o License of 128 users of HP (125 No.) o License of 300 Users of Aruba (HP) (257 No.) • 4 Main Distribution Switch (1 being used as Backup) • PoE Access Switch :96 • One no. NAS for Storage 12 TB and One no. SAN for Storage. **Licenses for Software** 1. Microsoft Educational Licensed Software under Cloud Technology (270 Users) 2. Other Microsoft Bundle Software 3. Windows Server 2012(R2) and Windows 2019 Standard 4. SQL Server 2019 under Windows 2012 Server **Other Licensed Software are also installed for different Department under central Facility** • PRO-E/PTC CREO under Mechanical Engineering Department • ANSYS for 3 departments (Mechanical/Electrical/Electronics) under Mechanical Engineering Department • STAD Pro 15 Users Civil Engineering Department • 4. MAT Lab 50 user License (with 5 users Tools for Base version for different Departments) 
iii.	Central Work shop	Central workshop was established in the year 1962. It is a central facility of university where undergraduate engineering Students fabricate their jobs in practical classes and final year project as per university curriculum. M.Tech. and Ph.D. students use Workshop facilities to fabricate their experimental setup for dissertation as well as research work. Students perform all types of fabrication work related to their co-curricular activities such as Robomania,

		Junkyard warz, efficycle, Baja SAE India organized by university robotics club and SAE collegiate club along with routine classes. 
iv.	Central Library	Fully Automated issue and return of books Equipped with Wi-Fi OPAC (Online Public Access Catalogue) is available for 24X7 on Intranet CCTV Camera R.O./Water Purifier Air-Conditioned Reading Room Facility Air-Conditioned E-Library cum Reading Room Facility Membership of National Digital Library of India (NDLI Club) Membership of ShodhGanga/ ShodhGangotri/ e-ShodhSindhu • GyanSindhu Digital Library (Remote Access Facility on Mobile/Laptop/Desktop) 
v.	Sports & Games Facilities	Council of Students Activities (CSA) has a brand-new, state-of-the-art sports stadium named 'Shaheed Bandhu Singh Stadium'. The stadium was inaugurated in 2020 by Hon'ble Chief Minister of Uttar Pradesh Shri Yogi Adityanath and has been named after the famous revolutionary of First War of Indian Independence Late Shri Bandhu Singh. Sprawling into 12 acres of land, the stadium has both outdoor as well as indoor facilities. The stadium has a Football ground, a Hockey ground, a Cricket pitch, a grassy ground for Track & Field activities, two indoor Basketball courts, and a Pavilion with 300 seating capacity. In addition to the stadium, facilities for the following indoor/outdoor sports are also available in the University: - • Indoor Sports: Table Tennis, Badminton, Carrom, Chess, and Billiards. • Outdoor Sports: Separate concrete courts for Skating and Tennis; Another grassy ground for Football, Kabaddi, & Volleyball. • Gymnasium: Separate gymnasium for boys and girls are available which are equipped with all modern facilities.

		In addition to the stadium, CSA has a fully air-conditioned auditorium 'Multi-Purpose Hall' (MPH) with seating capacity of 800 persons. The MPH has a 40 x 30 feet stage, two greenrooms, and a robust PA/ audio-visual presentation system. CSA also has a Cultural Ground near the Civil Engineering Department to host open air/outdoor functions. 
vi.	University Health Centre	The University Health Centre is opened 24 hours. In the University Health Centre, two MBBS Doctors, one Homeopath Doctor and one physiotherapist are working. There are 10 beds in the ward of the hospital to meet out the medical emergency. Hospital also has a well-equipped physiotherapy centre. One latest model airconditioned Ambulance service is available round the clock for shifting serious patient to referred hospital. 
vii.	University Guest House and Alumni Bhawan	University Guest House & Alumni Bhawan the University Guest House has total six double-bed well-furnished A.C. rooms. The Guest House facility is available to the external examiners, special invitees/guests of the University as well as to the parents of the students. University also has well-furnished Alumni Bhawan for the stay of official guests of University and Alumni. Prior booking of these rooms can be made by contacting the officer-in-charge, guest house. For booking of Alumni Bhawan, priority will be given to Alumni after the recommendation of Secretary/President of Malaviya Alumni Association. 

		
viii.	Banks/ Post office	University has in its premises a State Bank of India Branch and a Post Office also.
ix.	Boys/Girls Hostels	The University is residential institution with seven boys' hostels five girls' hostels. The hostels are well furnished with necessary amenities available with in hostel premises. The leased line Internet facility is available for 24x7 hours in every room of each hostel. Students admitted to the University hostels are provided with the necessary furniture. The students are personally responsible for upkeep of the articles issued to them by the warden in sound condition. First year students are provided with three/two-seater rooms as per the availability. Senior students are provided with double and single seated rooms depending upon availability. 
x.	T & P Cell	The Madan Mohan Malaviya University of Technology, Gorakhpur is a preferred academic institute for a large number of organizations for recruiting B.Tech., M.Tech., MCA, MBA and Ph.D. students. These organizations influenced by the capability, intellect and the professional readiness displayed by our students, have usually offered more jobs than they originally intended. From most of these organizations, we get to know many good things about the actual performance of our students. We have one of the best set of facilities the campus recruiters would like to have and we will be only pleased to make them available to the participating organizations. We also follow a simple and transparent placement policy.   

4.1.1 Contact Details:

S. N.	Program (Department)	Name of Departmental Head	Contact Email id
1.	Dean Research & Development and Professional Practices	Prof Rakesh kumar	phd.admission@mmmut.ac.in
2.	Ph.D. (Civil Engineering)	Prof A. K. Mishra	kmce@mmmut.ac.in
3.	Ph.D. (Computer Science and Engineering)	Prof. Udai Shanker	uscs@mmmut.ac.in.
4.	Ph.D. (Information Technology)	Prof. Shiva Prakash	spitca@mmmut.ac.in
5.	Ph.D. (Electrical Engineering)	Prof. Vinod Kumar Giri	vkgee@mmmut.ac.in
6.	Ph.D. (Electronics and Communication Engineering)	Prof. Sanjay Kumar Soni	sanjoo.ksoni@gmail.com, sksoniec@mmmut.ac.in
7.	Ph.D. (Mechanical Engineering)	Prof. Jeeoot Singh	jsme@mmmut.ac.in;
8.	Ph.D. (Chemical Engineering)	Prof. Vitthal L Gole	vlgch@mmmut.ac.in
9.	Ph.D. (Physics & Material Science)	Prof.P. P. Pande	pppches@mmmut.ac.in, pppande@gmail.com
10.	Ph.D. (Chemistry & Environmental Science)	Prof. D. K. Dwivedi	todkdwivedi@gmail.com, dkdpms@mmmut.ac.in
11.	Ph.D. (Mathematics& Scientific Computing)	Prof. V. K. Mishra	vkmmsc@mmmut.ac.in
12.	Ph.D. (Management Studies)	Prof. S C Jayswal	scjme@mmmut.ac.in;
13.	Ph.D. (Humanities & Social Sciences)	Dr. Sudhir Narayan Singh	snshms@mmmut.ac.in

5 RESEARCH PROFILE OF DEGREE OFFERING DEPARTMENTS

Department of Civil Engineering

5.1 Department of Civil Engineeing

The Department

B. Tech (CE) offered by this department has been accredited by the National Board of Accreditation as per Washington Accord. The Civil Engineering Department established in 1962, in Madan Mohan Malaviya University of Technology, Gorakhpur, is one of the oldest departments of the University, working since its inception. The department has, over the years, established its status as a centre for imparting high quality technical education to undergraduate and post-graduate students and extending consultancy services to industries and various government departments located in the Eastern U. P. Besides undergraduate course of B. Tech. (Civil Engineering), the department offers two regular P. G. courses viz. M. Tech. (Civil) in Structural Engineering, M. Tech. (Civil) in Hill Area Development Engineering, M. Tech. (Civil) in Environmental Engineering and M.Tech. (Civil) in Seismic Design & Earthquake Engineering. The facilities for doctoral research are also available in the department. The department has experienced and highly qualified faculty members. The department capitalizes on its qualified and dedicated faculty, which is clammeringto achieve excellence. Further the strength of the department also lies in the strong linkages it has with its alumni and various government/private organizations located in the region. The alumni of the department are well placed in various government / private organizations and are in close contact with the department. The department has been continuously interacting with the various government and private organizations in the form of consultancy works, expert advice, design projects etc. With the strength of faculty, the department has the potential to raise the standards of technical education to any desired level, if infrastructural facilities are augmented. Needless to mention, the college itself is located in the underdeveloped region of the eastern U.P., which is both flood and drought prone and lacks industrial development. These special needs of this underdeveloped region can only be tackled by us, because of our understanding of the local conditions.

Courses Offered

The Department offers 01 Undergraduate (UG), 04 PG and Ph.D. programmes. To keep in pacewith the current technological advancements, the UG and PG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the tech-world.

- B.Tech.-Civil Engineering: 150 Students-EightSemesters-ChoiceBasedCreditSystem
- M.Tech- Civil Engineering: 4 Courses: M. Tech. (Civil) in Structural Engineering, M. Tech. (Civil) in Hill Area Development Engineering, M. Tech. (Civil) in Environmental Engineering and M. Tech. (Civil) in Seismic Design & Earthquake Engineering.
- Doctor of Philosophy (Ph.D.) in Civil Engineering

Areas of Research

- Structural Engineering
- Hill Area Development Engineering
- Environmental Engineering
- Seismic Design & Earthquake Engineering.
- Geo technical Engineering
- Transportation Engineering
- Remote Sensing & GIS
- Hydraulics & Water Resources Engineering

Faculty Profile

1. Prof. A. K. Mishra

Designation: : Professor & Head
Qualifications: : Ph.D.
Areas of Interest : Transportation Engineering
M.Tech.Supervised : 54
Ph. D. Supervised : 1
Research Project : 1
: akmce@mmmut.ac.in
E-mail : +91- 9235500524
Phone

Bio Sketch: Dr. Arun Kumar Mishra is working as Professor and Head in department of Civil Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh, India. He has completed B.Tech. in Civil Engineering from Amravati University Maharastra. He obtained his M.Tech degree in 'Transportation Engineering' from Indian Institute of Technology, Bombay (IIT Bombay) India, and Ph.D. in Transportation Engineering from Bombay University, Maharastra. His research interest focuses on Traffic Engineering Pavement Design & Analysis and Advance Pavements Material. He has guided more than 60 M.Tech and 1 Ph.D. students and published more than 55 research papers in various reputed international and national journals and conferences.

2 Prof. Govind Pandey

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Designation: : Professor
Qualifications: :Ph.D.
Areas of Interest :Environmental Engineering
M.Tech.Supervised : 48
Ph.D. Supervised : Nil
E-mail :gpce@mmmut.ac.in
Phone :+91-9235500518

Bio Sketch: Dr. Govind Pandey is working as Professor in department of Civil Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur and working as a acting Director, Rajkiya Engineerig College Gonda. He has completed B.Tech. in Civil Engineering from Aligarh Muslim University (AMU), Aligarh in the year 1986 He obtained his M.Tech. degree in 'Hill Area Development' from MMMEC, Gorakhpur, in 1988 and Ph.D. in Environmental Engineering from Indian Institute of Technology, Roorkee (IIT Roorkee) in the year 2002, His research interest focuses on Environmental Engineering. He has guided more than 157 M.Tech. and 3 Ph.D. students and published more than 143 research papers in various reputed international and national journals and conferences.

3 Prof. Shri Ram

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Designation:	: Professor
Qualifications:	:Ph.. D.
Areas of Interest	: Hydraulics & Water Resource Engg., Fluvial Hydraulics, RiverEngg., Hydraulics Structures
M.Tech.Supervised	:65
Ph.D Supervised	:01
E-mail	: srcce@mmmut.ac.in
Phone	: +91-9235500519

Bio Sketch: Dr. ShriRam Chaurasia, received M. Tech degree from IIT BHU Varanasi and has earned a Ph.D. degree from DDU, Gorakhpur. During his doctoral tenure, he worked on a Local Scour around Bridge Pier. Dr. ShriRam's current interests include Hydraulics, Environmental Hydraulics and Fluvial Hydraulics. His other interests include different types of structure/hydraulic structures.

4 Dr. R. K. Shukla

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Designation:	: Associate Professor
Qualifications:	: Ph.D.
Areas of Interest	: Engineering Surveying, Remote sensing, GIS, GPS and Inertial Systems
M.Tech.Supervised	: 45
Ph.D. Supervised	:
E-mail	: rksce@mmmut.ac.in
Phone	: +91-9235500517

Bio Sketch: Dr. Rakesh Kumar Shukla is working as Associate Professor in department of Civil Engineering, Madan Mohan Malaviya University of Technology-Gorakhpur, Gorakhpur, Uttar Pradesh, India. He has completed B.E. in Civil Engineering from BIT Mesra Ranchi, (Jharkhand) India., M.E. in Civil Engineering with specialization in Photogrammetric Engineering and Remote Sensing from University of Roorkee (IIT Roorkee), India and PhD in Civil Engineering from University of Nottingham, Nottingham (United Kingdom). His research interest focuses on Remote sensing, GIS and Integration of GPS and Inertial Measurements for structural Health monitoring.

5 Dr. Sneha Gupta

Designation:	: Assistant Professor
Qualifications:	: B.Tech., M.Tech. & Ph.D
Areas of Interest	: Geotechnical Engineering, Soil Stabilization using waste materials, Ground Improvements, Human Health Risk Assessment due to contaminated soil
FellowshipAwarded	:MHRD Fellowship during M.Tech. and Ph.D.
M.Tech.Supervised	:37
Ph.D. Supervised	:2 Regular + 4 Part Time,
E-mail	: NIL
Phone	: sgce@mmmut.ac.in
	: +91-9235552354

Bio Sketch: Dr. Sneha Gupta is working as Assistant Professor in department of Civil Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh, India. She has completed B.Tech. in Civil Engineering from MMMEC Gorakhpur. She has done her M.Tech degree in 'Geotechnical Engineering' from MNNIT Allahbad and Ph.D. in Geo-Environmental Engineering from MNNIT Allahbad. Her research interest focuses on Geo-Environmental Engineering. She has guided more than 20 M.Tech students and published more than 10 research papers in various reputed international and national journals and conferences.

6 Dr. Madan Chandra Maurya

Designation:	: Assistant Professor
Qualifications:	: Ph.D.
Areas of Interest	:Structural Engineering: Steel Structures, Plastic Analysis, Bridge Engineering, Nonlinear Analysis
M.Tech.Supervised	: 47
Ph.D Supervised	:NIL
E-mail	: mcmce@mmmut.ac.in
Phone	: +91-8765783659
	GoogleScholar-https://sites.google.com/view/madanchandramaurya/home

Bio Sketch: Dr. Madan Chandra Maurya received M.Tech. (Structural Engineering) from National Institute of Technology, Srinagar (Jammu & Kashmir) and has earned a Ph.D. degree from MMMUT, Gorakhpur. During his doctoral tenure, he worked on CNT agglomeration effect on plate using Finite Element Method. He studied the flexural, Free-vibration and Hygro-thermal behaviour of nanocomposite plate using developed FEM code. Dr. Maurya's current interests

include analysis of Plates and Shells, Functionally Graded Material, Sandwich Structure, Composite (FRP/Steel-concrete) structures and Application of FRP in Civil Engineering. His other interests include Retrofitting of Structures, Condition Assessment of Existing Structures, Non-destructive Evaluation of RCC/Composite Structures, High Performance Concrete, Highrise Buildings, Design of Bridges/Culverts, Bacterial Concrete and different FEM software application as ANSYS, ABAQUS, SAP 2000, MIDAS Civil and COMSOL Multiphysics.

7 Dr. Vinay Bhushan Chauhan

Designation:	:Assistant Professor
Qualifications:	:Ph.D.
Areas of Interest	: Geotechnical Engineering, and Rock Mechanics and Rock Engineering
M.Tech.Supervised	: 20
Ph.D Supervised	: Total: 05 (Ongoing)01: Allowed for Thesis Submission04 (Ongoing: 01 Full Time, 03: Part time)
E-mail	:vbcce@mmmut.ac.in; chauhan.vinaybhushan@gmail.com
Phone	:7977947285
	GoogleScholarhttps://scholar.google.com/citations?user=7q_7wPEAAAAJ&hl=en
	Total Citations: 507; h-index 13; i10-index 22

Bio Sketch: Dr. Vinay Bhushan Chauhan is an esteemed Assistant Professor in the Department of Civil Engineering at Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh. His academic journey began with a B. Tech. in Civil Engineering from Kamla Nehru Institute of Technology, Sultanpur, Uttar Pradesh, where he demonstrated exceptional academic prowess and was awarded the prestigious university gold medal for securing the first position in the state. Throughout his educational career, he received multiple state and national-level scholarships, highlighting his dedication and excellence in the field. Dr. Chauhan pursued his academic aspirations by attaining a Master's degree from IIT Roorkee in 2011 and completing his Ph.D. in geotechnical engineering from IIT Bombay in 2017. His research focus centers around geotechnical engineering, wherein he has significantly contributed to various sub-disciplines. Dr. Chauhan is a prolific researcher who has published over 82 research papers in reputable national and international journals and conferences. Notably, his work has garnered attention from the academic community, with over 550+ citations of his research in a relatively short period. This recognition underscores the impact and relevance of his scholarly endeavors. Dr. Chauhan received the Prof. Joseph M. Sussman Best Paper Prize-2022 for his groundbreaking research featured in Frontiers in Built Environment, Transportation, and Transit Systems. His work specifically focuses on the study of foundations within rock masses. Dr. Chauhan has recently been honored with the prestigious IGS-Soiltech India Pvt. Ltd, Pune Young Geotechnical Engineer Award in the "Shallow Foundations" category for being selected for the Best Paper Award in 2023 by the Executive Committee of the Indian Geotechnical Society. Apart from his research pursuits, Dr. Chauhan

actively contributes to the academic community by serving as an editorial member and peer reviewer for several renowned journals. His expertise spans a wide range of areas within geotechnical engineering, including Earth pressure reduction techniques, foundation analysis, ground improvement techniques, transportation geo-techniques, finite element analysis, tunnel engineering, rock mechanics, and rock engineering.

8 Dr. Rohit Kumar

Designation: : Assistant Professor
Qualifications: : Ph.D. (Structural Engineering
Areas of Interest : Structural Engineering,
Geopolymer Concrete,
Repair and Rehabilitation,
Structural Health Monitoring
M.Tech.Supervised : 12
Ph.D Supervised : NIL
: Patent 02
E-mail : rkce@mmmut.ac.in
Phone : 91-8765783672
GoogleScholarhttps://scholar.google.co.in/citations?user=um_4LtQAAAAJ&hl=en

Bio Sketch: Dr. Rohit Kumar's expertise spans across Building Technology, Construction Management, Concrete Technology, Construction Materials, Non-Destructive Testing, and Characterization of Construction Materials. His passion lies in exploring innovative approaches to enhance structural integrity and efficiency in construction practices. With a prolific academic record, Dr. Kumar has made notable contributions to the field. He has authored 2 papers in SCI-indexed journals, 4 papers indexed in Scopus, 04 conference papers published in Scopus-indexed proceedings and 1 paper recognized in UGC Care. Moreover, his inventive prowess extends to patents, with 4 granted patents showcasing his innovative solutions in the realm of construction materials. As an Assistant Professor, Dr. Kumar blends his academic acumen with practical insights garnered from years of experience. His teaching methodology involves integrating real-world applications into theoretical concepts, fostering an engaging learning environment that nurtures critical thinking among students. Dr. Kumar's research initiatives concentrate on optimizing construction techniques and material usage for sustainable infrastructure development. His work in non-destructive testing and characterization of construction materials aims to revolutionize quality assessment methodologies. Apart from scholarly pursuits, Dr. Kumar actively participates in community-driven initiatives, advocating for advancements in construction methodologies for societal betterment. His commitment to academia, research, and community engagement solidifies his role as a valued member of the Civil Engineering domain.

9 Dr. Pradeep Muley

Designation:	: Assistant Professor
Qualifications:	: Ph.D. (Earthquake Engineering, IIT Roorkee),
Areas of Interest	:Geotechnical Engineering, Geotechnical Earthquake Engineering.,Soil Dynamics, Liquefaction of Soils, Ground improvement, GeotechnicalInvestigation, in-situ and laboratory tests of Soil Fellowship under MHRD Scheme for Ph.D. at IIT Roorkee, 2010
M.Tech.Supervised	: 25
Ph.D. Supervised	: NIL
Patent	: 01
E-mail	: pmce@mmmut.ac.in
Phone	: +91-8765783705
	GoogleScholarhttps://scholar.google.co.in/citations?hl=en&user=pZ3fHfcAAAAJ

Bio Sketch: Dr. Pradeep Muley is working as Assistant Professor in department of Civil Engineering, Madan Mohan Malaviya University of Technology-Gorakhpur, Gorakhpur, Uttar Pradesh, India. Before joining MMMUT, Gorakhpur he also served in Amity University Noida Campus. He has completed B.Tech. in Civil Engineering from Samrat Ashok Technological Institute, Vidisha, (S.A.T.I. Vidisha, M.P.), he earned his M.Tech degree in 'Geotechnical Engineering' from Maulana Azad National Institute of Technology Bhopal (MANIT Bhopal), India, and PhD in Geotechnical Earthquake Engineering from Indian Institute of Technology, Roorkee (IIT Roorkee). His research interest focuses on Geotechnical Earthquake Engineering., Geotechnical Engineering, Soil Dynamics, Liquefaction of Soils, Ground improvement, Geotechnical Investigation, in-situ, and laboratory tests of Soil. He has guided 25 M.Tech Students and published More than 21 Research papers in various reputed international and national journals and conferences. Dr. Muley organized 10 Nos. Faculty Development Programs (FDPs), Short-Term Courses (STCs), and expert talks in the Civil Engineering Department at MMMUT Gorakhpur. Dr. Muley has delivered 10 experts talk as a resource person in Faculty Development Programs, Short-Term Courses, and chaired technical sessions in International/National Conference.

Department of Computer Science & Engineering

5.2 Department of Computer Science & Engineering

The Department

The Department of Computer Science & Engineering, Madan Mohan Malaviya University of Technology (formerly Madan Mohan Malaviya Engineering College, Gorakhpur) wasestablished in 1984 and with time it has earned the recognition as one of the top Computer Science & Engineering programs in the State of UP. Throughout its sparkling history of 38 years, the departmentof CSE has been known for its exceptionally strong Under-Graduate, Post-GraduateandResearchprograms. The department has always been on a progressive path; thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Departmenthas been equipped with sanctioned strength of 26faculty members: 04 Professors ,06 Associate Professors,16 Assistant Professors. Most of the faculty members available today are Doctoral degree holders.

Courses Offered

The department offers 01 Undergraduate (UG) & 01 Postgraduate (PG), and Ph. Dprograms. The UG program started in 1984.The PG program on Computer Science & Engineering was started in the year 2008. The Master of Technology program is a two-year course-based program. Students take admission to the above courses from with in and outside the department, according to the program requirements. The courses offered are of a high standard; many include advanced topics and topics based on recent research. In addition, the Department also offers high quality research program at the doctor allevel.

To keep in pace with the current technological advancements, the UGcurriculum has been recently modified as per NEP 2020, so that the students get a feel of what exactly is happening outside in thetech-world.

- B.Tech.-Computer Science & Engineering: 255 students–Eight Semesters-Choice Based Credit System
- M.Tech.-Computer Science & Engineering: 21students- Four Semesters-Choice Based Credit System
- Doctor of Philosophy (Ph.D.)

Areas of Research

Presently our faculties are undertaking research in following broad areas:

- **Database Technology Database core technology:** Query processing & optimization, Index & storage systems, Data model & query language, Databases for emerging hardware, Machine learning for database, Data warehouse & OLAP, Transaction management
- **Domain-specific/advanced database systems**: Data processing in VR/AR/MR, Graph data management, Data management in social networks, Embedded & mobile databases, Temporal & spatial databases, Data streams & time-series data, Knowledge management, Text databases, Multimedia databases, HCI for modern information system, Natural language query interface,

Probabilistic & uncertain data, Sensor data management, Statistical and scientific databases

- **Cloud data management:** Cloud data management, Bigdata management (e.g, MapReduce, Spark), Parallel & distributed database systems, Data semantics & data integration, Information integration, Blockchain
- **Data Science & Advanced Applications**Data science: Data-driven AI technology, Data mining & knowledge discovery, Neural network, Graph & social network analysis, RDF & knowledge graphs, Text & data mining,Advanced applications: Search & recommendation technology, Security, privacy & trust, Data quality & credibility, Bio & health informatics, Data science for epidemics (e.g., COVID-19), Semantic Web & knowledge management, Crowdsourcing, Data archive & digital library, Web information systems, Information extraction and summarization.
- **Computer Networks:** Routing and Survivability of optical networks, Performance of Elastic optical network, Performance of SDM-WDM optical networks, Application of Machine learning in Optical Networks.
- **Cloud and Fog Computing:** Task Scheduling, SLA Management, Service Selection, Load Balancing, Virtual Machine Migration and Consolidation, Integration of Fog and Cloud with Internet of Things for better response, Placement of IoT application on Fog nodes.
- **AI & Machine learning in computer vision:** Using deep learning techniques. Learning important features using machine learning, time series data analysis, wearable sensors, medical images/signals (CT, DTI, MRI, fMRI, ECG), Speech processing, natural language processing, fraud detection, graph analytics/mining, deep learning on graphs or probabilistic graphical models. Mathematical optimization and dimensionality/model reduction in neural networks

Faculty Profile

1. Prof. Udai Shanker

Designation:	: Professorand Head of the Department,
Qualifications:	: Ph.D. (Structural Engineering
Areas of Interest	: Research interest includes Blockchain Technology, Real Time Systems, Distributed Real Time Database Systems, Mobile Distributed Real Time Database and Grid Database.
E-mail	: uscs@mmmut.ac.in.
Phone	: 91-8765783672

Bio-Sketch: Dr. Udai Shanker received his B.E. degree from M. M. M. Engineering College Gorakhpur, India in 1986 and M.E. degree in Computer Engineering Specialization from ETCE Department of Jadavpur University, Calcutta, India in 1998. He did his PhD degree from Indian Institute of Technology Roorkee, Roorkee in 2006 under supervision of Dr. Anil K. Sarje and Dr. Manoj Misra. He is looking forward to continue and expand his research activities and relationships after he has settled into a new department i.e. Computer Sc. & Engineering department, M. M. M. Engineering College, Gorakhpur-273010, India as an assistant professor.

He prefers to work that confronts him with difficult or complex problems and expected to take initiative to

fix that. Always, he comes up with new approaches and procedures. He believes in and supports the work he is doing and would like to be a part of it. With PhD and M.E. degrees from computer engineering, he believes he is well prepared for teaching most of the undergraduate and graduate level courses of computer science/engineering. Even though he can teach almost all the CS/CSE courses, to utilize his expertise to the best, he would prefer to teach courses in the areas, he feels more comfortable. He is interested in teaching CS students at both undergraduate and graduate level, including but not limited to topics like file and database management, databases and information systems, advanced research topics in database systems, algorithms and data structures, formal languages, and programming etc. Dr. Shanker has published many scientific papers in national/international journal/conferences of their own repute. His long-term career goal is to be a technical leader in building more seamless and efficient systems for voluminous data management. With this dream of being research leader, he looks ahead to identifying more next-generation applications of data management technology and fostering collaborations necessary to enable those applications. His research work is directly related to the topic within the scope of large-scale data management systems and demonstrates his abilities to be successful in achieving it. His current research interest includes Distributed Real Time Database Systems, Mobile Database Systems and Grid Databases. He is also an editorial board member of many international journals.

2. Dr. Rakesh Kumar

Designation: : Professor
Qualifications: : Ph.D. (IIT/R)

Areas of Interest: Internet of Things (IoT), Wireless Sensor Networks, Network Security, Machine Learning and Data Analytics, Cloud Computing and Image Processing.

E-mail : rkcs@mmmut.ac.in.
Phone : 91-9235500529
Home Page :http://www.mmmut.ac.in/view?ab=3

Bio-Sketch: Dr Rakesh Kumar is a Professor in the Department of Computer Science & Engineering at Madan Mohan Malaviya University of Technology, Gorakhpur (U.P.), India. He received his B.E., Computer Engineering from Madan Mohan Malaviya Engineering College Gorakhpur, UP India and M.E., Computer Engineering from SGS Institute of Technology and Science, Indore. He obtained PhD from Indian Institute of Technology, Roorkee (IIT/R) in 2011. Before joining Madan Mohan Malaviya Engineering College Gorakhpur-UP India, he also served in Harcourt Butler Technological Institute (HBTI) Kanpur, UP India and Bundelkhand Institute of Engineering and Technology (BIET) Jhansi, UP India. He has successfully completed One Major Research Project (MRP) sanctioned from UGC, New Delhi, Two MODROBS Projects sanctioned by AICTE New Delhi., India. He is a recipient of Best Research Paper Award during International Conference on Information Processing (ICIP-2007), August 10-12, 2007, Bangalore, India.

Prof Kumar has been included in the prestigious World's Top 2% Scientists of his domain in a list published by Stanford University for the year 2023. Eleven research scholars have completed their Ph.D. and, currently, many M Tech and research scholars are working under his guidance. He has published more than 100+ research papers in various international and national journals and conferences of high repute and

is also on the editorial boards of national and international journals. He is a member of IEEE, CSI (LM), ISTE (LM), Fellow of IETE and IE (India) and Member, AENG. He has reviewed a number of research articles for reputed International Journals and acted as Member, Technical Program Committee for International Conferences and also chaired Sessions in International Conferences. His research interests are in the areas of Internet of Things (IoT), Wireless Sensor Networks, Network Security, Machine Learning & Data Analytics, Cloud Computing, and Image Processing.

3. Prof. P. K. Singh

Designation, Qualifications: Professor, PhD
Areas of Interest: Parallel Computing, Storage Systems, Machine Learning.
E-mail: pkscs@mmmmut.ac.in
Phone: +91-9235500529
Home Page: https://sites.google.com/view/pksmmmut/home

Bio-Sketch: Dr Pradeep Kumar Singh is a Professor in the Department of Computer Science & Engineering at Madan Mohan Malaviya University of Technology, Gorakhpur (U.P.), India. He received his B.E., Computer Engineering from Madan Mohan Malaviya Engineering College Gorakhpur, UP India and MTech., Computer Science and Technology from University of Roorkee, Roorkee. He obtained PhD from Madan Mohan Malaviya Engineering College Gorakhpur. Six research scholars have completed their Ph.D. and currently, many M Tech and research scholars are working under his guidance. He has published more than 70 research papers in various international and national journals and conferences of high repute and is also on the editorial boards of national and international journals. He is a Sinor member of IEEE, CSI (LM), ISTE (LM) and Fellow of IE (India). He has reviewed a number of research articles for reputed International Journals including IEEE Transections, Technical Program Committee for International Conferences and also chaired Sessions in International Conferences. His research interests are in the areas of Parallel Computing, Storage Systems and Machine Learning.

4 Dr. Rohit KumarTiwari

Designation : Assistant Professor
Qualifications :Ph.D. (MMMUT-Gorakhpur), M.Tech. (NIT-Kurukshetra with Gold Medal)
Areas of Interest :Service Selection in Cloud and Fog Computing, Task Scheduling in Cloud, Load Balancing, Computer Vision, and Machine Learning Applications
E-mail :rktcs@mmmut.ac.in.
Phone :+91-8765783673
Home Page : http://mmmut.ac.in/view?ab=3

Bio Sketch: Dr.

Rohit Kumar Tiwari is working as Assistant Professor in department of Computer Science & Engineering, Madan Mohan Malaviya University of Technology-Gorakhpur, Gorakhpur, Uttar Pradesh, India. He has completed B.Tech. in Computer Science & Engineering from BIET-Jhansi, India, M.Tech. in Computer Engineering with Gold Medal from NIT-Kurukshetra, India and PhD in Computer Science & Engineering from Madan Mohan Malaviya University of Technology Gorakhpur. His research interest focuses on Cloud Computing, Fog Computing and Computer Vision.

5 Dr. S. K. Saroj

Designation: Assistant Professor
Qualifications: Ph.D. (MMMUT Gorakhpur), M.Tech. (MNNIT-Prayagraj)
Areas of Interest: Image processing, information security
E-mail: skscs@mmmut.ac.in.
Phone: +91-8765783676
HomePage:https://sites.google.com/view/sushil-kumar-saroj/home

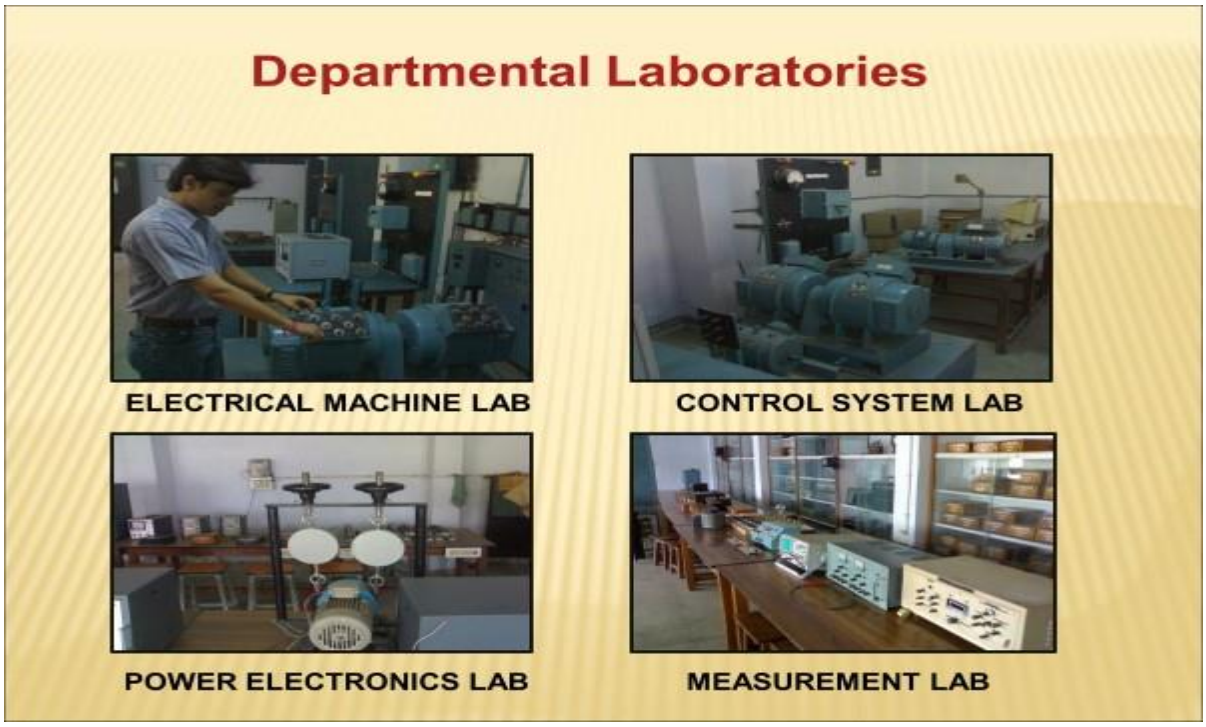
Bio Sketch: Dr. Sushil Kumar Saroj is working as Assistant Professor in department of Computer Science and Engineering, Madan Mohan Malaviya University of Technology (MMMUT), Gorakhpur, Uttar Pradesh, India. He has completed B.Tech. from IET-Lucknow, India. He has completed M.Tech. from MNNIT-Allahabad, India. He has received PhD degree from MMMUT-Gorakhpur, India. His research interest focuses on Image processing and information security.

Laboratory Infrastructure

Eachstate-of-the-art laboratory is managed by a Faculty-in-Charge and a technical staff and has the best-of-breed equipment featuring advanced technology.

Computing Lab 1: i3 based systems 20 Nos.
Computing Lab 2: i7 based systems 40 Nos.
Computing Lab 3: i7 based systems 25 Nos
Computing Lab 4: Workstatins 20 Nos.
Computing Lab 5: i7 based systems 29 Nos.
Computing Lab 6: i7 based systems 29 Nos.
Computer Centre: Workstations 21 Nos

Department of Electrical Engineering



5.3 Department of Electrical Engineering

The Department of Electrical Engineering, Madan Mohan MalaviyaUniversity of Technology Gorakhpur was established in the year 2013 by the Government of Uttar Pradesh in the form of a non-affiliating technical university after reconstituting the formerly Madan Mohan Malaviya Engineering College, Gorakhpur which was established in 1962. The Department of Electrical Engineering was established in 1962 as a founding department and is one of the oldest departments of the university (formerly college). Throughout its sparkling history of 61 years, the department tof EE has been known for its exceptionally strong Under-Graduate studies since beginning and then same for also for the post-graduate studies and the Research programs.

The department has, over the years, established its reputation as an excellent center for imparting high quality technical education to UG and PG students and provides consultancy/testing facility to industries and government organizations inside and outside the U.P. The Department of Electrical Engineering offers one UG and two PG programs (specializations in i. Power Electronics & Drives (PED) ii. Control and Instrumentation (CI)) and Ph.D. programs. The department has qualified faculty members and is equipped with state-of-the-art research facilities and infrastructure for the latest experimental and computational facilities for taking up advance research and development for consultancy activities in electrical engineering.

The department also has a well-qualified, devoted, and dedicated team of teaching and supporting staff members. The department has always been on a progressive path, thanks to the experiencedand dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has 31 faculty members, 04 Professors, 02 Associate Professors, 04 Assistant Professors, and 21 Guest Faculties. Most of the faculty members are having Doctoral degrees.

Courses Offered

The Department offers 01 Undergraduate (UG) and 02 Postgraduate (PG) and Ph.D.programs. The UG program offering B.E. degree was started in 1962, right from the inception of the college. The first PG program offering a degree of M.Tech. in Power Electronics & Drives was started in 2001. The second PG program offering a degree of M.Tech. in Control and Instrumentation was startedin the year 2013. The rapid developments in the field of electrical engineering are triggeringthe department for inception of third PG program offering degree of M.Tech. in Power Systems soon in the coming years.The courses offered are ofhigh standard, many include advanced topics and topics based on recent research.In addition, the Department also offers high quality research programs at thedoctorallevel. To keep in pace with the current technological advancements, the UG and PGcurriculum has been recently modified so that the students get a feel of whatexactlyishappeningoutsideinthetech-world. The UG/PG/PhD programs offered by the department as following:

1. B.Tech. – Electrical Engineering:180 students–8 Semesters-Choice Based Credit System
2. M.Tech.– Power Electronics & Drives (PED): 22 students-4Semesters-Choice Based Credit System

3. M.Tech.– Control and Instrumentation (CI): 21 students-4 Semesters-Choice Based Credit System.
4. Doctor of Philosophy (Ph.D.)

Areas of Research

Presently our faculty is undertaking research in followingbroadareas:

1 Power Systems

Power systems planning, restructuring and deregulation, generation, transmission and distribution systems, distributed power generations, thermal, solar, wind energy power generation systems, smart grids, DC/AC microgrids, STATCOM, PMU, Opal-RT implementation, and non-conventional energy resources, etc.

2 Control Systems

Modelingandsimulation, model-order reduction, linear & nonlinear control theory, controller design, PID control, adaptive control, optimal control, robust control theories & applications, robotics & automation, neural networks, fuzzy-logic, GA, PSO, and other evolutionary techniques applications, etc.

3 Instrumentation and Signal Processing

Instrumentation systems, electrical & electronic measurement, digital signal processing (DSP), filtering theory, bio-medical instrumentation, bio-medical signal processing, etc.

4 Renewable Energy

Renewable energy systems modelling and simulation, non-conventional energy resources, solar photo-voltaic systems, solar-thermal, wind energy generating units, small hydro power generating units, maximum power point tracking (MPPT) techniques, hydrogen energy etc.

5 Electric Vehicles

Electric vehicles modelling and design and applications, robotic vehicles, e-rickshaw, smart vehicles, optimization, and control, etc.

6 Applications of AI in Electrical Engineering

Applications of AI techniques in the different sub-domains of electrical engineering.

FacultyProfile

1 Prof. Vinod Kumar Giri

Designation, Qualifications: Professor and Head of the Department, Ph.D.

Areas of Interest: Bioinstrumentation, DSP, Control & Instrumentation, Health Monitoring of Electrical Machine, ECG data Compression, Telemedicine.

E-mail: vkgee@mmmut.ac.in

Phone:9897792404, 7355951200

HomePage:http://mmmut.ac.in/view?ab=4

Bio-Sketch:

Dr. V K Giri obtained his B.E. (Electrical) degree from REC (presently SVNIT), Surat, Gujrat, in 1988, M.E. Hons. degree from University of Roorkee in 1997 and Ph.D. degree from IIT Roorkee, in 2003. He joined the Electrical Engineering Department of MMMUT, Gorakhpur, U.P. in 1989 as lecturer. He holds the position of Professor in the same department since 2008. He was appointed as the founder Director of Rajkiya Engineering College, Sonbhadra, He has published more than 165 research papers, guided 27 PG students, supervised 07 Ph.D. and is supervising 08 Ph.D.& authored 03 books. He has received many awards including "The Corps of Engineers Prize", IEI(I). He is a fellow/member of different professional bodies such as FIETE, FISI(I), MCSI, MISTE. He is a reviewer of severalinternational and national journals. He has been the Member/Member-Secretary of BoG, BoM, EC, FC and Chairman/Member of BOS of different Institutes/Universities. He has also undertaken many consultancies, testing & sponsored projects from industries and government departments. His area of specializations is Bio-instrumentation, DSP, Control & Instrumentation, Health Monitoring of Electrical Machine, ECG data Compression, Telemedicine

2. Prof. S. K. Srivastava

Designation, Qualifications: Professor, Ph.D.

Areas of Interest: Power Systems, Power Systems Planning & Restructuring, Deregulation, Electrical Machines & Drives,

Email:sksee@mmmut.a.in

Phone:9235500544

HomePage: http://www.mmmut.ac.in/view?ab=4

Bio-Sketch:

Dr. S. K. Srivastava obtained his degrees of B.E. in Electrical Engineering from Madan Mohan Malaviya Engineering College Gorakhpur (India), M. Tech. from I.I.T. Delhi (India), and Ph.D. from U.P. Technical University Lucknow (India) in the year 1986, 1993, and 2008 respectively. Presently, he is working as Professor in the Department of Electrical Engineering Madan Mohan Malaviya University of Technology Gorakhpur (U.P), India. His research interests include power system operation and control, power quality, FACTS devices & controllers, restructured electricity market, congestion management in power system, etc. He has published more than 80 research papers in international and national journals and conferences. He is Member of IEEE, IEEE(PES), Fellow of The Institution of Engineers (India) (FIE), Fellow of The Institution of Electronics and Telecommunication Engineers (FIETE). He received best research paper award in year 2007 for published paper in National Journal of CPRI (India).

3. Prof. Amar Nath Tiwari

Designation, Qualifications: Professor, Ph.D.

Areas of Interest: Power Electronics, Electrical Drives and Power Quality.

Email:antee@mmmut.ac.in

Phone:9235500548

HomePage:http://www.mmmut.ac.in/view?ab=4

Bio-Sketch: Prof. Amar Nath Tiwari was born in Amethi, India, in 1965. He received the B.Tech. degree in electrical engineering from the Regional Engineering College affiliated to University of Calicut, Kerala, India, in 1988, and the M.Tech. degree in electrical engineering from the Indian Institute of Technology (IIT) Kanpur, and the Ph.D. degree in electrical engineering from the Indian Institute of Technology (IIT) Roorkee, Roorkee, India, in 1996 and 2003, respectively. In 1989, he joined the Department of Electrical Engineering, M.M.M. Engineering College, Gorakhpur, India, as a Lecturer, in 2000 joined as Assistant Professor, in 2006 joined as Associate Professor and in 2016 joined as Professor. His current research interests include power electronics, electrical machines and drives, active filters, wind and solar power energy and power quality. He is member of IEEE, fellow of the Institution of Engineers (India), fellow of the Institution of Electronics and Telecommunication Engineers (IETE) and Life Member of the Indian Society for Technical Education (ISTE), India. He has supervised more than 60 M.Tech. and 08 PhD theses. He has contributed more than 65 papers in National/International Journals and Conferences.

4. Prof.A. K. Pandey

Designation, Qualifications: Professor, Ph.D.

Areas of Interest: Electric Drives and RenewableEnergy

E-mail:akpee@mmmut.ac.in

Phone:9235500546

HomePage:http://www.mmmut.ac.in/view?ab=4

Bio-Sketch: Prof. A. K. Pandey holds a doctoral degree in the area of Electric Drives from IIT Roorkee, India in the year 2003. Presently he is Professor in Electrical Engineering Department MMMUT, Gorakhpur (formerly, MMMEC, Gorakhpur). His current area of interest is electric drives and renewable energy. He has published 74 papers in International/National Journal and Conferences. He is Fellow of IE (India) and IETE (India).

5. Dr. L. B. Prasad

Designation, Qualifications: Associate Professor, Ph.D.

Areas of Interest: Control Systems, Intelligent Systems & Control, Adaptive and Optimal Control, Nonlinear Control, Power & Energy Systems Control, Industrial Control, Robotics & Automation, Microprocessors.

Email:lbpee@mmmut.ac.in

Phone:9235500564

HomePage:http://www.mmmut.ac.in/view?ab=4

Bio-Sketch: Dr. Lal Bahadur Prasad was born in Kushinagar (U.P.), India. He studied for his high school and intermediate educations at Government Inter College (G.I.C.) Deoria. He obtained his B.E. in Electrical Engineering from Madan Mohan Malaviya Engineering College (Now Madan Mohan Malaviya University of Technology) Gorakhpur, India, in 1994, and his M.Tech. in Electrical Engineering (Control Systems) from Institute of Technology, Banaras Hindu University (i.e. Indian Institute of Technology), B.H.U., Varanasi, India, in 1997. He has been an Indian Defence Service of Engineers (IDSE) officer and has served as Assistant Executive Engineer (Electrical) in Military Engineering Services (MES), Ministry of Defence, Govt. of India during 1997-99. In 1999 he switched over to engineering teaching career. He pursued his Ph.D. research work in Department of Electrical Engineering, Indian Institute of Technology Roorkee, India under QIP scheme since 2009 and obtained his Ph.D. degree in 2015. Presently, he is serving as Associate Professor in Department of Electrical Engineering, Madan Mohan Malaviya University of Technology (Formerly Madan Mohan Malaviya Engineering College) Gorakhpur, Uttar Pradesh, India. He has published about 56 research papers in international journals, and international and national conferences. He has supervised 42 M.Tech. Dissertations, 40 B.E./B.Tech. Projects, and is supervising 02 Ph.D. Theses. His research interests include control systems & applications, adaptive and optimal control, nonlinear control, intelligent control systems & applications, power & energy systems control. He is life member of Institution of Engineers (India), and life member of Institution of Electronics & Telecommunication Engineers (India). He is member of IEEE and IEEE Control Systems Society. He is member of Automatic Control and Dynamic Optimization Society (ACDOS), India.

6.Dr. Prabhakar Tiwari

Designation, Qualifications: Associate Professor, Ph.D.

Areas of Interest: Power System, Renewable Energy, Distributed Generation, Power System Pricing.

E-mail:ptee@mmmut.ac.in

Phone:8765783850

Home Page:http://www.mmmut.ac.in/view?ab=4

Bio-Sketch: Dr. Prabhakar Tiwari holds a Doctoral Degree in Power System Pricing from JMI Central University, New Delhi in 2012. He is M.Tech. from IITD in 1999 and B.E. from MMMEC, Gorakhpur in 1998. Presently he is an Associate Professor in the Electrical Engineering Department, Madan Mohan Malaviya University of Technology, Gorakhpur. He is a nominated member of the Executive Committee & Chair of the Conference Committee of the IEEE UP Section. His current area of research is Power System Pricing, Restructured Power System, Renewable Energy and Distributed Generation (DG). He has published more than 100 papers in reputed International/National Journals and Conferences. He is a life member of ISTE and IE(I). He is also Senior Member of IEEE, Member Power & Energy Society, Smart Grid Society, and IEEE Education Society. Dr. Tiwari has been winner of the Outstanding Section Volunteer Award 2015, Secretary PES Chapter IEEE UP Section 2015, Professional Activity Committee Convener IEEE UP Section in 2016&2017, Joint Secretary IEEE UP Section in 2018 & 2019, Secretary IEEE UP Section in 2020, 2021, Chairman Conference Committee IEEE UP Section 2022 & 2023. Dr. Tiwari had been Chair and member of different committees of more than 45 International/National Conferences including Organizing Chair of the most noted Conference of first version of IEEE UP Section conference UPCON, ICEEE, ICE3 and many more events, written 2 books, 4 book Chapters, edited 7 books, one patent (Under process of grant), more than 25 consultancies for UPPTCL, Govt. of UP and published more than 100 papers in the different National & International Journals and Conferences, Organized more than 30 National & International Conferences/ STC/FDP/STTP/Workshops/Seminars for

faculty and students.

7. Dr. Awadhesh Kumar

Designation, Qualifications: Assistant Professor, Ph.D

Areas of Interest: Control Systems, Nonlinear Control, Application of Optimization

and Artificial Intelligence to Control Design, Optimal, Suboptimal and Adaptive Control Design, Model Order Reduction.

E-mail:akee@mmmut.ac.in

Phone:923501645

HomePage: http://mmmut.ac.in/FacultyList?ab=4

Bio-Sketch: Dr. Awadhesh Kumar is currently working as an Assistant Professor, Senior Scale in the Department of Electrical Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur. He received his bachelor's degree in electrical and Electronics Engineering from Birla Institute of Technology (BIT), Mesra, Ranchi, Master's degree in Instrumentation and Control from National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh Punjab, and Ph.D. Degree from Motilal Nehru Institute of Technology (MNNIT) Allahabad, in Electrical Engineering.Dr. Kumar is currently the Professional member of Automatic Control and Dynamic Optimization Society (ACDOS) India, International Federation of Automatic Control (IFAC) affiliate, Professional member of IEEE and Institution of Engineers (IE) India and Professional Member of International Association of Engineers (IAENG).He was the topper of the district Gorakhpur in High School with 80.4% marks and stood second among all the M. Tech. Students in his batch at NITTTR Chandigarh with 85.1% marks. During his Ph.D., he secured 10/10 CPI in MNNIT, Allahabad.Earlier, Dr. Kumar had served at the United College of Engineering and Research Allahabad in the capacity of Lecturer and Senior Lecturer. He had also served as Assistant Professor and Head of the Department, Electrical Engineering, in LDC Institute of Technical Studies, Allahabad, Uttar Pradesh. His teaching interests during past eighteen years, mainly include Basic System Analysis, Network Analysis and Synthesis, Control Systems, Digital Control, Process Dynamics & Control, Neural Networks, Fuzzy Systems and Optimization Techniques.His research interests mainly include Control Systems, Model Order Reduction, Controller Design, Modelling and simulation through MATLAB, Applications of Artificial Intelligence and Optimization Techniques to Control design, Control Applications to Energy Systems/Power Systems/Electric Vehicles/Robotics/UAVs. Dr. Kumar, has guided two Ph.D. and 34 M.Tech thesis. Presently, 9 Ph.D and 3 M.Tech. scholars are working under him. He has guided more than 30 B.Tech. projects in which two projects have been selected and sponsored by the Council of Science & Technology (CST), UP. Dr. Kumar is a regular reviewer of many International and National journals. He has published 80 research papers in reputed journals and conferences including 14 SCI indexed journals. He has delivered 30 expert lectures, organized 12 STC/STTP/FDP, and attended 70 professional training workshops.

8. Lt.K. B. Sahay

Designation, Qualifications: Assistant Professor,

M.Tech., Ph.D. (Pursuing)

Area of Interest: Power System, Application of AI in Power System

Phone:9235501652

Email:kbsee@mmmut.ac.in

HomePage: http://www.mmmut.ac.in/view?ab=4

Bio-Sketch:

Techniques in power system & use of artificial intelligence to forecast electricity load, price, solar & wind power. He has published more than 50 international research papers, which include 14 abroad Scopus indexed IEEE conference publications. He is also a writer of 03 International Book. He is a reviewer of few International Journals. He has also received excellence in teaching award-2018.

9. Dr. Navdeep Singh

Designation, Qualifications: Assistant Professor, Ph.D.

Areas of Interest: Research focuses on Renewable energy, Power electronic converters and their stability analysis, Load frequency controller, Power quality improvement-based converter, DC microgrids, Electric vehicle controller and converter operation.

Phone: 9235552351

E-mail:nsee@mmmut.ac.in

HomePage:https://mmmut.irins.org/profile/142829

Bio-Sketch: Dr. Navdeep Singh holds a Doctoral Degree in Electrical Engineering from Department of Electrical Engineering, College/University: Motilal Nehru National Institute of Technology (M.N.N.I.T.), Allahabad, U.P., India in 2015. Presently he has been Assistant Professor in Department of Electrical Engineering, Madan Mohan Malaviya University of Technology (MMMUT) Gorakhpur since 2015. He has published 25 SCI/SCOPUS papers in reputed International/National Journals, 34, International/National Conferences, and 7 book chapters. One Project has been completed on Digital controller for Matrix converter. He has guided 2 Ph.D. theses and 27 M.Tech. dissertations. Currently, Dr. Singh is guiding 6 Ph.D. (out of these Two in advanced stage) students and 3 M. Tech students. He has also coordinated almost 12 workshops/FDP/conferences. His current area of research focuses on Renewable Energy, Power Electronic Converters and their stability analysis, Electric vehicle controller and converter operation, Load frequency controller, Power quality improvement-based converter and DC microgrids.

10.Dr. Shekhar Yadav

Designation, Qualifications: Assistant Professor, Ph.D.

Areas of Interest: Control System, Optimization, and Advanced Controller Design for Electric Vehicles.

E-mail:syee@mmmut.ac.in

Phone:8765783665

HomePage:http://www.mmmut.ac.in/view?ab=4

Bio-Sketch: Dr. Shekhar Yadav received his bachelor's degree inelectricalengineering from the Institute of Engineering & Technology, M. J. P. Rohilkhand University, Bareilly, in 2007, master's degree in Control Systems and Ph.D. in Electrical Engineering from Indian Institute of Technology (BHU) Varanasi in 2010 and 2017 respectively. He is working as an Assistant Professor in the Department of Electrical Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur, since July 2016. He has published two books, five books' chapters, and many papers in International/ National Journals/Conference. He has guided 28 M. Tech. thesis and presently supervising 09 Ph.D. students. He has received one research project from UPCST, Lucknow and one project from AICTE, New Delhi under SPICES scheme. He was awarded with the "BEST PROJECT in the 5th National Level IEEE Project Competition-2021, organized by IEEE Student Branch (STB17861), GSSSIETW in association with IEEE Bangalore Section and IEEE Mysore Subsection on 26th June 2021. He has also received various awards at the State/National Level. Presently he is working in Control Theory and its applications.

Laboratory Infrastructure

Eachstate-of-the-artlaboratoryismanagedbyaFaculty-In-Chargeanda staff-in-charge (Lab Technician) and has modern laboratory kits, equipment etc. The different labs available in the department are as following:

- Circuit Lab: Experimental kits for RLC series and parallel resonance circuits, KVL, KCL, and Network theorems.
- Network Lab: Experimental kits & setups for verification of network theorems- Thevenin's, Norton's, Superposition, Maximum power transfer theorem, Telligen's theorem, two-port network parameters Z/Y/T/hybrid parameters.
- Control Lab: Experimental kits & setups for studies of Position control system, Servomechanism, P/PI/PD/PID controller, DC servomotor, AC servomotor, Synchros, Magnetic amplifier, Amplidyne/Metadyne etc.
- Power Electronics Lab: Experimental kits & setups for studies of Thyristors, choppers, rectifiers, inverters, converters, etc.
- Power Systems Lab: Experimental kits & setups for studies of ABCD parameters of transmission line, L-G, L-L faults, load flow analysis, etc.
- Switchgear & Protection Lab: Experimental kits & setups for studies of Isolators, circuit breakers, MCB, MCCB, CT/PT, earthing systems etc.
- Electrical Machines Lab: Experimental setups for studies of Transformers, DC, AC motors and generators, special machines.
- Drives Lab: Experimental setups for studies of Electric drives & applications.
- Microprocessors Lab: Experimental kits for studies of 8085 and 8086 microprocessors, micro-controllers, embedded controllers, math coprocessors, peripheral cards, etc.
- Computer Simulation Lab: Experiments using MATLAB software.
- Electrical Wiring & Winding Lab: Electric wiring and motor winding, etc.

In addition to this the first-year students learn how toconnect simple electrical circuits with AC and DC voltage sources and to connectmulti-meter as ammeter andvoltmeter, wattmeter, energy-meteretc. For measuring voltage, current, power, power factor (pf) and energy (consumed inunits) in an electrical circuit. The studentsget fascinated to see and learn all the sethings when they join engineering education after their school life.

2. Research Lab:

This lab has been setup to facilitate research scholars to conduct cutting edge research in the field of electrical engineering having latest hardware & software tools, setups etc.

Department of Electronics and Communication Engineering Department

5.4 Department of Electronics and Communication Engineering Department

The Department

The Department of Electronics & Communication Engineering was established in the year 1973 with an intake of 20 and has gradually increased to 75 from the academic session 2000-2001 and 120 from the academic session 2015-2016. The Department has made all-round progress in the last four decades because of firm determination and continuous efforts made by all the faculty members and staff of the department.

The Department offers full timeMTech. in "Nanoelectronics and VLSI" and "Wireless and Optical Communication" respectively with an intake of 23 and 22 students in respective specialization. The Department of Electronics and Communication Engineering has incessantly maintained an excellent academic record. The appreciable virtue of the department is its vibrant learning circumstances where all the students and faculty members nourish the spirit of innovation, creativity and contribute productively to the evolution of technology. The department has excellent lab resources which are being enhanced from time to time and impart sufficient opportunities for the students to grasp and innovate. Students are motivated to take part in several activities like paper presentation, technical quiz, project design, project contest and cultural activities. Students are encouraged to go through in-plant training and various industrial visits are scheduled each year to get industry exposure.

The Department also offers regular Ph.D. program through QIP & TEQIP/University schemes. To enhance the knowledge of students and fulfill the gap among the academia and industries, the Department has recently established the Center of Excellence (CoE) Lab by the Texas Instruments under the Texas Instruments University Program, IoT& Embedded System Project Lab and Artificial & Drone Design Project Lab.

The Department has always been on a progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has 23 faculty members, 02 Professors, ,07 Assistant Professors and14 Guest faculty on contract. Most of the faculty members are Doctoral degree holders.

Courses Offered

The department offers various Undergraduate and Post-graduate courses.

Under-Graduate (UG):

- B.Tech. in Electronics & Communication Engineering (ECE)
- B.Tech. in Electronics & Communication Engineering (IoT)

The Programme Education Objectives of B.Tech. in Electronics & Communication Engineering are-

- Excel in professional career and/or higher education by acquiring knowledge in the area of Electronics and Communication Engineering.
- Analyze real life problems, design appropriate systems to provide solutions that are technically sound, economically feasible and socially acceptable.
- Exhibit professionalism, ethical attitude, communication skills, teamwork in their profession and adapt to current trends by engaging in life-long learning.

Post-graduate (PG):

1. M.Tech. in Nanoelectronics and VLSI
2. M.Tech. in Wireless and Optical Communication

- B.Tech.-ElectronicsandCommunicationEngineering:180 students- Eight Semesters-Choice Based Credit System
- B.Tech.-Electronicsand Communication Engineering (Internet of Things): 73 students-Eight Semesters-Choice Based Credit System
- M.Tech.–Nanoelectronics and VLSI: 23 students- Four Semesters-Choice Based Credit System
- M.Tech.–Wireless and Optical Communication: 22students- Four Semesters- Choice Based Credit System

Doctor of Philosophy (Ph.D.)

Areas of Research

Presentlyyourfacultyisundertakingresearchinthe following broad areas:

- Nanoelectronics Devices and circuits/VLSI.
- Optoelectronics Devices and Circuits, Photonics.
- Wireless communication, 5G wireless channel modeling, IOT, 5G Enabled Drone Technology.
- Optical communication and beyond the CMOS devices.
- RF/Microwave antennas, arrays, metamaterials, filters, Micro-strip antenna and filter design, dielectric Resonator antenna.
- AI, Machine learning, Deep learning.

FacultyProfile

1. Prof. Sanjay Kumar Soni

Designation, Qualifications: Professor and Head of the Department, Ph.D.

Areas of Interest: UAV (Drone), IoT and Artificial Intelligence, Wireless Communication, Propagation Channel Modeling.

E-mail:sanjoo.ksoni@gmail.com, sksoniec@mmmut.ac.in

Phone: +91-9235501651

Bio-Sketch:

Prof. Sanjay Kumar Soni holds a Doctoral Degree in Wireless Communication from the Indian Institute of Technology Kharagpur (IIT Kharagpur), India, in 2011. Presently, he is Professor and Head in the Department of Electronics and Communication Engineering, Madan Mohan Malaviya University of Technology Gorakhpur. His current area of research is UAV (Drone), IoT and Artificial Intelligence, Wireless Communication, Propagation Channel Modeling. He has published 106 papers in reputed International/National and Journals and Conferences. He is a life member of IEI, IETE & ISTE and is a IEEE member. Prof. Soni has been awarded Best Paper award at the International Conference in UPCON-2018 (2-4 November 2018). Also, He has awarded Best Teacher Award-2016 by G.B. Pant Institute of Engineering and Technology, 2016. He is a reviewer of a few International Journals.Under his guidance, 19 Ph.D. and 25 M.Tech. have been completed and presently 08 Ph.D. and 02 M.Tech. are in progress. He

has been strongly associated with many sponsored and consultancy research projects.

- Development of IoT and Drone based Agriculture Monitoring System with Objective of Skill Development of Socially Deprived Community" sponsored by Ministry of Electronics and Information Technology (MeiTy), Govt. of India, New Delhi. **Amount: 2.895 Crore, Chief Investigator: Prof. S. K. Soni** "Development of IoT based Fish Monitoring System," **Amount: 30 Lakhs. Chief Investigator: Prof. S. K. Soni, Sponsored by NABARD, Govt. of India.**
- Testbed Design for Spectral Sensing of Cognitive Radio with 5G Applications. **Prof. S. K. Soni (Co-PI): Sponsered by CRS Scheme Under NPIU TEQIP-III, Amount: 17.75 Lacs.**
- Development of IoT Controlled Frequency/Pattern Reconfigurable MIMO Antenna for Energy Harvesting Systems. **Prof. S. K. Soni (Co-PI): Sponsered by CRS Scheme Under NPIU TEQIP-III: 18.97 Lacs**.

2. Prof. Rajeev Kumar Chauhan

Designation, Qualifications: Professor, Ph.D.
Areas of Interest: Microelectronics in general and circuits Modelling and Simulation of MOS based devices and in particular, Analog and Digital Integrated Circuits, VLSI Technology & Design, Microstrip based filter design, Semiconductor device and circuitand Photovoltaic.
E-mail: rkcece@mmmut.ac.in and rkchauhan27@gmail.com
Phone: +91-9235500556

Bio-Sketch: Prof. Rajeev Kemar Chauhan holds a Doctoral Degree in MOS based Devices and Circuits from the Indian Institute of Technology, BHU (IIT BHU), India, in 2002. Presently, he is a Professor in the Department of Electronics and Communication Engineering, Madan Mohan Malaviya University of Technology Gorakhpur. His current area of research is Modelling and Simulation of MOS based devices and circuits, VLSI Technology & Design and Microstrip based filter Design. He has published more than 240 papers in reputed International/National and Journals and Conferences. He is a member of IETE and ISTE.Prof. Chuhan has been awarded Best Paper award at the International Conference IICT-2007 held at DIT, Dehradun from 27-29 July 2007. He is a reviewer of a few International Journals. He has supervised 06 Ph.D. and 82 M.Tech. and is currently supervising 11 Ph.D. and 1 M.Tech. He has been awarded with 01patent and 05 published. He has been actively engaged in consultancy and sponsored research work. Some of the projects completed as well in progress are as follows:

- Chief Investigator of MeitY sponsored project under C2S scheme on "**Design of Low Power Memory Circuits**", Approval Letter details: EE-9/2/2021-R&D-E, date:22-05-2023(Rs. 85-Lacs, Ongoing).
- Principle Investigator of an AICTE sponsored R&D project, sanctioned in 2011 on "**Design and Development of SRAMs**" (Rs. 8-Lacs, Completed)
- Co-Principle Investigator of UPCST sponsored R&D project, sanctioned in 2018 on "**UWB Antennas for Breast Cancer Detection**" (Rs. 12.09 Lakhs, Completed)
- Co-Principle Investigator of TEQIP-III sponsored R&D project, sanctioned in 2019 on "**Gallium Oxide Technology Development for Designing High Power Semiconductor Devices**" (Rs. 15.29 Lakhs, Completed)

3. Dr. Rajan Mishra

Designation, Qualifications: Assistant Professor, Ph.D.

AreasofInterest: Microstrip Antenna and IoT in healthcare and Agriculture sectors, Solar Cell

E-mail:rajanmishra1231@gmail.com, rmece@mmmut.ac.in

Phone: +91-9235500560

Bio-Sketch: Dr. Rajan Mishra received B.Tech. and M.Tech. degrees in 2001 and 2007, respectively, in Electronics & Communication Engineering and his Ph.D. degree MNNIT Allahabad, Prayagraj in 2018. He has been working as an Assistant professor in MMMUT, Gorakhpur India since 2009. He has successfully completed a sponsored research project of Rs 12.09 Lacs as a PI sponsored by UP CST. Currently, he is working as a CO-CI in the project of Rs. 289.5 Lacs sponsored by MeitY, Government of India. He has supervised 02 Ph.D. and 50 M.Tech. Dissertation successfully. Two research scholars have completed their Ph.D. and, currently, research scholars are working under his guidance. He has more than 50 publications in International and national journals and various reputed conferences.

4. Dr. Sudhansu Verma

Designation, Qualifications: Assistant Professor, Ph.D.

AreasofInterest: Printed Antennas, Reconfigurable Antennas, Wearable Textile Antennas, EM bandgap Structures, Metamaterials based Antennas, Branchline Couplers, Wilkinson Power Dividers, Microstrip Filters

E-mail:svermaeced@gmail.com, svece@mmmut.ac.in

Phone: +91-7376251972

Bio-Sketch:

Dr. Sudhansu Verma completed his Doctoral Degree in Wireless Communication from the Indian Institute of Technology Patna (IIT Patna), Patna, Bihar, India, in 2014.Presentlyheis Assistant Professor in the DepartmentofElectronicsandCommunication Engineering, Madan Mohan Malaviya University of Technology Gorakhpur. His current area of research is Printed Antennas, Reconfigurable Antennas, Wearable Textile Antennas, EM bandgap Structures, Metamaterials based Antennas, Branchline Couplers, Wilkinson Power Dividers, Microstrip Filters.Hehaspublished72papersinreputedInternational/National and Journals and Conferences. He is a senior member of OPTICA and IEEE. He has been awarded Best Research Poster Award @IIT Patna, March 2013. He is a reviewer of a few reputed International Journals. Till now, under his guidance 1(One) Ph.D. have been completed and 08(eight) Ph.D. is in progress. Also, he has completed a TEQIP-III Sponsored project entitled "Development of Textile Antennas for ISM Band Applications".

5 Dr. Gagandeep Bharti

Designation, Qualifications: Assistant Professor, Ph.D.

Areas of Interest: Microstrip Antenna, Dielectric Resonator Antenna, MIMO/Diversity Antenna

E-mail: gagankec13@gmail.com dbece@mmmut.ac.in

Phone: +91-9235501650, +91-9794937656

Bio-Sketch:Dr. Gagandeep Bharti completed his Doctoral Degree from Madan Mohan Malaviya University of Technology, Gorakhpur in 2022. He has been working as an Assistant professor in MMMUT, Gorakhpur India since 2015. Two research scholars are working under his guidance. He has more than 25 publications in International and national journals and various reputed conferences. Till now, he has supervised 20 M.Tech. and is currently supervising 4 Ph.D and 1 M.Tech thesis. He has also delivered many invited talks, served as a session chair in conferences and organized several FDP.

6. Dr. Pooja Lohia

Designation, Qualifications: Assistant Professor, Ph.D.

Areas of Interest: Synthesis and characterization of optical material and devices, Design, and characterization of optical fiber sensor, SPR sensor, PCF sensor and Solar cell (Organic & Perovskite).

E-mail:lohia.pooja6@gmail.com, plece@mmmut.ac.in

Phone: +91-9235552359

Bio-Sketch:Pooja Lohia is an Assistant Professor in the Department of Electronics and Communication Engineering, MMMUT, Gorakhpur. Her current area of research is Synthesis and characterization of optical material and devices, Design and characterization of optical fiber sensor, SPR sensor, PCF sensor and Solar cell (Organic & Perovskite). Dr. Lohia has guided 3 Ph.D students and currently she is guiding 6 Ph.d students. She has guided more than 13 M. Tech. thesis in dissertation project work. She has published more than 100 research papers in reputed International Journals, Proceedings of International and National Conferences. She is an Editor of Advanced Journal of Graduate Research and International Journal of Current sciences and Technology. She has also delivered several invited talks and organized Workshops/Short Term Courses.

Major Research Project*:*

- "Development and characterization of selenium-based chalcogenide glasses for phase change memory (PCM) devices" funded by CST-UP, Lucknow, (Project Cost 11.44 Lakh,

Duration March 2021-Feb 2024).

- "Development of surface plasmon resonance based optical biosensor for various cancer cell detection using 2D nanomaterials" funded by CST-UP, Lucknow, (Project cost 13.08 Lakh)

7. Dr. Dharmendra Kumar

Designation, Qualifications: Assistant Professor, Ph.D.

Areas of Interest: Nano-Optoelectronics, Nanoelectronics, optical fiber communication, Photonic crystal fiber, sensors

E-mail:dharmendra0127@gmail.com, dkece@mmmut.ac.in

Phone: +91-8756599979

Bio-Sketch: Dr. Dharmendra Kumar holds a Doctoral Degree in Nanoelectronics from the Indian Institute of Technology ISM (IIT ISM), IIT(ISM), Dhanbad, Jharkhand, India, in 2016. Presently, he is an Assistant Professor of the Department of Electronics and Communication Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur. Dr Kumar has expertise in Photonic Crystal Fiber, Optical Fiber Sensors, and nanophotonics. He is a senior member of IEEE and a Senior member of Optical society of America (OPTICA). He has published more than 80 research papers in National and International SCI Journals and Conferences such as IEEE Transactions on Nanotechnology, IEEE Journal of Quantum Electronics, IEEE Sensor Journal, IEEE transaction on nanoscience, IEEE Transactions on Plasma Science, superlattices and microstructure, JOSA B and applied optics etc. He has also delivered many invited talks and serves as a session chair in IEEE conferences. Till now, he has guided 4(Four) Ph.D. candidates and 18 (Eighteen) M. Tech dissertations. He has been actively engaged in consultancy and sponsored research work. Some of the projects completed as well in progress are as follows:

- Design and Analysis of Optical Waveguide for Biosensing Application: **Dr. Dharmendra Kumar (COPI) CRS scheme Under TEQIP-III Rs. 11 lacs** 1 Year [Extended 1 year] (Completed).
- Theoretical Investigation of Electronic and Optical Properties of Semiconductor Quantum Dots: **Dr. Dharmendra Kumar Research Initiation Grant Under TEQIP-III, Rs.2 lacs** 2 Years (Completed)

8. Dr. Anupam Sahu

Designation, Qualifications: Assistant Professor,Ph.D.

Areas of Interest: Nanoelectronics, photonics and optoelectronics devices, Condensed matter physics

E-mail:anupam.or.sahu@gmail.com, asece@mmmut.ac.in

Phone: +91-8765783685

Bio-Sketch: Dr Anupam Sahu received Ph. D, (August 2021), from Madan Mohan Malaviya University of Technology, Gorakhpur (U.P.). He has completed M. Tech, (June 2013) from Indian Institute of Technology, BHU (Varanasi) and B. Tech (June 2011), from Chandra Shekhar Azad University Kanpur. He is currently working as an Assistant Professor in Department of Electronics and Communication Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur (U.P.) Gorakhpur since June 2016. His research interests include nanoelectronics, quantum electronics, and optical properties of

semiconductor heterostructure. He has authored or co-authored over 50 papers in various journals and conferences in these areas of research. Also, he is CO-PI of ongoing NABARD sponsored (Rs. 20.80 lacs) project entitled “Development of IoT and AI Based Smart Fish-Pond Water Quality Monitoring System in Deoria”.

9.Dr. Bramha P. Pandey

Designation, Qualifications: Assistant Professor,Ph.D.

AreasofInterest: Fundamentals of Electronics devices,

Optoelectronics and 2D Materials & Devices

E-mail:pandey.bramha@gmail.commailto:, bppece@mmmut.ac.in

Phone: +91-8954143009

Bio-Sketch*:* Dr. Brahma P. Pandey holds a Doctoral Degree in Electronics Engineeringfrom the Indian Institute of Technology ISM, IIT(ISM), Dhanbad, Jharkhand, India, in 2015.Presently, he is an Assistant Professor in the DepartmentoElectronicsandCommunication Engineering, Madan Mohan Malaviya University of Technology Gorakhpur. His current area of research is Nanomaterials and Nanodevices, Sensors.Hehaspublishedmore than 63papersinreputedInternational/National and Journals and Conferences. He is a life member of MOSI, MRSIICEIT and ISTE. Under his supervision, 02 Ph.D. & 8 MTech. is completed and 04 Ph.D. and 2 MTech. is in progress. He is a reviewer of a few International Journals. He has been actively engaged in consultancy and sponsored research work. Some of the projects completed as well in progress are as follows:

- Research Initiation Grant (RIG) of Rs. 2,00,000/- from MMMUT, Gorakhpur for the period of 2 years for the Project “Electronic, optical and photovoltaic properties of the 2D materials”. Completed.
- “Design of Low Power Memory Circuits” **Amount: Rs (Lacs) 85.936. PI: Dr. Bramha P. Pandey, sponsored for 5 years in C2S MeitY, New Delhi.**

LaboratoryInfrastructure

AI & Drone Design:

This lab is associated to design and development of IoT, Drone based agriculture monitoring system to boost the feature and yield of farming plot. Moreover, we also target to train the students in IoT, Drone and AI and offer comprehensive infrastructure to students to complete their several projects in the area of smart IoT board, Drone design and AI.

Basic Electronics Lab: This is our fundamental set of laboratories, in terms of basic electronics. This is the main lab where basic experiments like device characteristics and basic analog circuits are performed. This lab is broad enough to clutch a number of experiments appropriate for giving students enough experience to assist them to easily take on experiments in more advanced laboratories in the department.

CAD LAB: The CAD Lab is intended at providing experience to and enhancing the understanding and skills of engineers involved in the operation use of CAD packages. A well-resourced computer lab with the most recent facilities is established for the benefit of theelectronics engineering students. High end terminals held by the latest hardware and software, latest visual aids, plotting devices, etc. are among them.

EMI LAB: EMI lab offers the knowledge about the various types of Bridge, Measurement of Strain using Strain gauge, Different components and parameters like Q of a Coil using LCR Q-meter, Differential pressure transducer& signal conditioning.

Microprocessor LAB: This laboratory is used to offer intensive practical exposure to the students in the arena of microprocessor architecture and industrial control through them. This lab has various types of microprocessors, microcontroller trainer kits along with interfacing modules to describe the comprehensive applications of microprocessors.

Communication LAB: In this laboratory, our students are skilled in making the circuits for analog and digital modulations. The fundamentals of all types of modulation and demodulation, and recent communication methods are verified using available hardware and software tools.

VLSI Design LAB: VLSI Design Lab in Electronics Communication Engineering Department has the well-established research facilities in the domain of VLSI design both in analog and digital domain. Well recognized EDA tools from reputed vendors such as Mentor Graphics and Cadence are available for VLSI design flow as well as device simulation.

Wireless Communication Research Lab: The research fellows working in thearea of wireless communication carry their research in the lab. The output ofthelabisintermsofnumerousresearchpaperspublishedinreputedjournals. SDR, Wireless inSitesimulator.

Embedded Systems Lab: Advanced microcontrollers related to IoT, Drone devices and Proteus simulator are available in the lab.

Department of Mechanical Engineering

5.5 Department of Mechanical Engineering

The department of Mechanical engineering came into existence in the year 1962, the year of inception of the college. It is a major and pioneer department of the college, imparting instructions leading to the bachelor's degree in mechanical engineering and master's degree in computer integrated manufacturing (CIM). The department offers Ph.D. courses also. Since its inception the department has actively participated in teaching, training, design, development, research, and extension activities. The department has brought out graduates, postgraduates and Ph.D. who have excelled in every field; they have gone to and have brought laurels to the college. This extraordinary success has been achieved due to the highly qualified and dedicated faculty and technicians and also to the curriculum and the facilities in the department. The courses are meticulously designed for basic concepts and keep the students in tune with the latest developments and advances in mechanical engineering. The students graduating from this department have just the right ingredients to set the industrial, managerial, administrative world ablaze with their achievements. The list of distinguished alumni of the department available through the alumni link corroborates the statements made.

Courses Offered

- B. Tech in Mechanical Engineering
- M.Tech. in Energy Technology and Management
- M.Tech. in Computer Integrated Manufacturing
- Ph.D. in Mechanical Engineering

Faculty Profile

1. **Dr. Jeeoot Singh**

Designation, Qualifications:	Professor & Head, PhD
Areas of Interest:	Modelling and Optimization of Hybrid/Advanced Machining Processes, Laser Processing of Materials
E-mail:	jsme@mmmut.ac.in;
Phone:	9235500565
HomePage:	http://www.mmmut.ac.in/view?ab=6

Bio sketch: Dr. Jeeoot Singh is currently Professor in the Mechanical Engineering Department at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He received his B. E (Mechanical Engineering) from MNREC Allahabad, M. Tech from IIT Delhi, and Ph.D. from Motilal Nehru National Institute of Technology Allahabad, Prayag Raj India. Have 22 Yrs. of Experience in teaching and research at reputed Institutes. Guided 4 PhD and 24 M Tech students. Published more than 50 research publications and have been a consultant for Govt of Bihar, Govt of Jharkhand, Jaypee Industries, SOMA Industries, GATI Industries. I have also associated with Indian Railway Institute of Mechanical and Electrical Engineering as visiting faculty for 12 yrs. Have taken administrative responsibilities as Registrar and Head of Department at MMMUT Gorakhpur. Research interest includes Computational Mechanics, Meshfree methods, FGM plates, Energy and exergy analysis etc.

2. **Dr. S C Jayswal**

Designation, Qualifications:	Professor, PhD
Areas of Interest:	Advanced Manufacturing Processes, Computer Aided Manufacturing, Finite Element Analysis, Modeling and Simulation
E-mail:	scjme@mmmut.ac.in;
Phone:	9235500569
HomePage:	http://www.mmmut.ac.in/view?ab=6

Bio Sketch: Dr. S C jayswal is currently Professor in the Mechanical Engineering Department at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He received his B. E (Mechanical Engineering) from Madan Mohan Malaviya University of Technology, Gorakhpur, India, M. E from MNREC Allahabad, Prayag Raj India, and Ph.D. from IITKanpur, India. He has 30 Yrs. of Experience in teaching and research at reputed Institutes. Guided 4 PhD and 37 M Tech students. Published more than 100 research publications.

3 Dr. Sanjay Mishra

Designation, Qualifications:	Professor, PhD
AreasofInterest:	Modelling and Optimization of Hybrid/Advanced Machining Processes, Laser Processing of Materials
E-mail:	smme@mmmut.ac.in; sanjaymnnit74@gmail.com
Phone:	8765935332
HomePage:	http://www.mmmut.ac.in/FacultyList?ab=6

Bio sketch: Dr. Sanjay Mishra is currently Professor in the Mechanical Engineering Department at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He received hisB. E (Production Engineering) from Sardar Vallabhbhai National Institute of Technology, Surat, Gujarat, M.E from BITS Pilani, and Ph.D. from Motilal Nehru National Institute of TechnologyAllahabad, PrayagrajIndia. His research interests are in advance manufacturing processes, lasermaterial processing, finite element method in manufacturing, and hybrid machining. He has more than 75 research papers in reputed journals and conference proceedings. He has guided 3 Ph.D. theses and more than 10 M.Tech. theses. He has 20 years of teaching and research

experience.

4 **Dr. Devesh Kumar**

Designation, Qualifications:	Assistant Professor, PhD
AreasofInterest:	Thermal Engineering, Fluid mechanics, computational fluid dynamics, Solar Energy and Biofuel etc.
E-mail:	dkme@mmmut.ac.in; dev77mmmut@gmail.com
Phone:	9235500682
HomePage:	http://www.mmmut.ac.in/FacultyList?ab=6

Bio -Sketch: Dr. Devesh Kumar has received his B.Tech degree in Mechanical Engineering from Harcourt Butler Technological University Kanpur, India in 1999.He did M.Tech in Applied Mechanics Department from Indian Institute of Technology Delhi in 2003.He did his M.Tech under the supervision of Professor K.K. Chaudhary.He did his Ph.D in Thermal Engineering under the supervision of Prof. B.B.Arora from Delhi Technical University Delhi, India in 2020.After completing education he has served in different organisation. Presently he is working as Assistant Professor in Mechanical Engineering department of Madan Mohan Malaviya University of Technology Gorakhpur (UP), India-273010 since January 2015.He has research interest in Thermal Engineering, Fluid mechanics, computational fluid dynamics, Solar Energy and Biofuel etc. He is teaching different courses in UG and PG level. He has published different research papers in reputed journals and conferences. He is working as reviewer in reputed journals. He is also taking different responsibilities at Department and University level.

5 **Dr. Ram Bilas Prasad**

Designation, Qualifications:	Assistant Professor, PhD
AreasofInterest:	Computational Mechanics, Meshfree Method, Mechanics of Solid, Biomechanics, Robotics, Machine Design
E-mail:	rbpme@mmmut.ac.in; rbp.mmmut@gmail.com
Phone:	9235501649
HomePage:	http://www.mmmut.ac.in/FacultyList?ab=6

Bio sketch: Dr. Ram Bilas Prasad is currently Assistant Professor in the Mechanical Engineering Department at Madan Mohan Malaviya University of Technology, Gorakhpur, UP, India. He received his B. E (Mechanical Engineering) from Pt. Ravi Shankar Shukla University, Raipur (C.G.)

(GEC Raipur, Now NIT Raipur), M.Tech from IIT Bombay, Mumbai, and Ph.D. from M.M.M. University of Technology, Gorakhpur UP, India. His research interests are in Computational Mechanics, Meshfree Method, Mechanics of Solid, Biomechanics, Robotics and Machine Design. He has more than 39 research papers in reputed journals and conference proceedings. He is guiding 5 Ph.D. theses and guides more than 26 M.Tech. dissertation. He has 18 years of teaching and research and industrial experience.

6 Dr. Dheerandra Singh

Designation, Qualifications:	Assistant Professor, Ph.D.
Area of Interest:	Thermal Engineering, Energy Engineering
E-mail:	dsme@mmmut.ac.in dheerendra403@gmail.com
Phone:	9235552352
Home Page:	http://mmmut.ac.in/view?ab=6

Bio Sketch: Dr. Dheerandra Singh is currently Assistant Professor (Level-11) in the Mechanical Engineering Department at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He received his B.Tech. (Mechanical Engineering) from GBTU Lucknow, M. Tech from NIT Patna, and Ph.D. from MMMUT Gorakhpur. He has08 Yrs. of experience in teaching and research at MMMUT Gorakhpur. He has guided 31 M Tech students and 16 B.Tech. projects. He has published 36 research publications in referred journals and conferences. He has different academic as well as administrative responsibilities in the University.The research interest includes Thermal Engineering and Energy engineeringwhich include mainly Solar Drying, Solar Distillation, Solar Cooking, Solar Air Heating, Thermal Comfort etc.

7 Dr. Prashant Saini

Designation, Qualifications:	Assistant Professor, PhD
AreasofInterest:	Thermodynamics, Heat Transfer, Biofuels, Nanofluids, Solar Energy
E-mail:	psme@mmmut.ac.in
Phone:	9235552360
HomePage:	http://www.mmmut.ac.in/view?ab=6

Bio sketch: Dr. Prashant Saini is currently working as Assistant Professor in the Department of Mechanical Engineering at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He received his B. Tech (Mechanical Engineering) from Bundelkhand Institute of Engineering & Technology, Jhansi, Uttar Pradesh; M. Tech (Thermal Engineering) from NIT Warangal, Andhra Pradesh and Ph.D. from Madan Mohan Malaviya University of Technology, Gorakhpur India. His research interests are in Thermodynamics, Heat Transfer, Biofuels, Nanofluids and Solar Energy. He has published more than 35 research papers in reputed journals and conference proceedings. He

has guided 30 M. Tech dissertations and 14 B. Tech projects. Currently, he is supervising Ph D thesis, M. Tech dissertation and B Tech projects. He has 10 years of teaching and research experience.

8 **Mr Sunil Kumar Yadav**

Designation, Qualifications:	Assistant Professor, Ph D (Pursuing)
AreasofInterest:	Hybrid/Advanced Machining Processes, Friction Stir Welding, TIG & MIG
E-mail:	skyme@mmmut.ac.in; sunilnitj22@gmail.com
Phone:	9235552353
HomePage:	http://www.mmmut.ac.in/FacultyList?ab=6

Bio sketch: Mr Sunil Kumar Yadav is currently Assistant Professor in the Mechanical Engineering Department at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He received hisB. Tech (Mechanical Engineering) from AKTU, Lucknow, Uttar Pradesh, M. Tech from Dr B R Ambedkar NIT, Jalandhar, Punjab and Pursuing Ph.D. from Madan Mohan Malaviya University of Technology Gorakhpur, Uttar Pradesh. His research interests are in advance manufacturing processes, Friction stir welding, TIG and MIG welding. He has more than 19 research papers in reputed journals and conference proceedings. He has guided more than 18 M. Tech thesis. He has 09 years of teaching and research experience.

Laboratory Infrastructure

The department has the following well-equipped laboratories enriching the technical knowledge of the students:

- Advanced Machining Lab
- Computer Lab
- Fluid Machinery Lab
- Heat Transfer Lab
- IC Engine & Automobile Lab
- Mechanical Measurement Lab
- Material Science Lab
- Metrology Lab
- Refrigeration & Air Conditioning Lab
- Strength of Material Lab
- Theory of Machine Lab
- Thermodynamics Lab

Department of

Information Technology & Computer Application

5.6 Department of Information Technology and Computer Application

The Department

The Department of Information Technology and Computer Application (ITCA) was inaugurated on 24th August 2018 by Hon'ble Chancellor of Uttar Pradesh Shri Ram Naik in the magnanimous presence of Hon'ble Vice-Chancellor of MMMUT Gorakhpur. The department became functional from 25th August 2018 with two PG programs - **MCA** and **M. Tech. and Ph.D**. Programme It has also started one UG program- **B.Tech. (IT)** from the session 2019-20. The ITCA department aims to achieve national and international recognition through the educational and research achievements of its faculty and students. The department has dedicated and highly motivated faculty members who used to make all possible efforts to prepare the student and PhD research scholar to become a successful IT professional and a very good researcher making significant contributions to the development and growth of our nation. The department has a vast legacy of well-placed and highly reputed alumni working in India and abroad.

Courses Offered

The Department offers 01 Undergraduate (UG) and 02 Postgraduate (PG) and Ph. Dprogramme. The UG programme was started in 2019 with an intake of 75. The first PG programme in Master of Computer Application (MCA) was started int the year 1987 with intake 20 in CSE Department and since 25th August 2018 with intake of 75 in ITCA department. The second PG programme M. Tech in Information Technology was started with an intake of 18in the year 2006 in CSE department and since 25th August 2018 with intake 22 in ITCA department. The rapid developments in the field of Information Technology, the courses of these programs continually upgraded to make them as per Industries and academia requirement. The Masterprogramsaretwo-yearcourses based on ChoiceBasedCreditSystem. Studentstakecourseswithinandoutsidethedepartment, according to the programme requirements. The courses offered are ofhigh standard, which includes advanced topics based on recent research. In addition, the department also offers high quality research programme at thedoctorallevel in various areas.To keep in pace with the current technological advancements, the UG and PGcurriculum has been modified time-to-time so that the students get a feel of whatexactlyishappeningoutsideinthetech-world.
The programme offered by department of ITCA are summarized below:

- **B. Tech**- Information Technology:120 students–Eight Semesters-Choice Based Credit System
- **M.Tech**.- Information Technology: 2 2 students-Four Semesters- Choice Based Credit System
- **Doctor of Philosophy** (Ph.D.)

Areas of Research

Presently our faculty is undertaking research in following broad areas: Internet of Things (IoT), Cloud Computing, Blockchain, Machine Learning & Deep Learning, Artificial Intelligence, Neural Network, Social Networks, Web Semantic, Big data Analytics, Wireless Sensor Network, Natural Language Processing, Cryptography & Network Security.

- **IoT and Networks Security**

Blockchain & Cryptocurrency, Information Security & Cyber Laws, Big Data Technologies, Web Semantic, Social Networks, Wireless Sensor Network, Mobile Ad Hoc Network, Cloud Computing, Sensor Cloud, Routingand Internetworking, Advance concepts wired/wireless networks,

Internet of Things, Software Defined Network (SDN), Big data Analytics, Application of MachineLearning and Deep Learning inNetworks/IoT, Cryptography & Network Security.

- **AI and Machine Learning**

Mathematical optimization and dimensionality/model reduction in neural networks. Pattern Recognition, Feature Extraction/Selection, Classification, Segmentation, and reconstruction using deep learning techniques. Learning important featuresusing machine learning, time series data analysis, wearable sensors, medicalimages/signals (CT, DTI, MRI, fMRI, ECG), Speech processing, natural language processing, fraud detection, graphanalytics/mining, deep learning on graphs orprobabilistic graphical models, Big data Analytics and Computer Vision.

Faculty Profile

1. Prof. Shiva Prakash

Designation: Professor and Head of the Department
Qualifications: Ph.D.
Areas of Interest: Wired/Wireless Networks, IoT, Mobile and Cloud Computing, Algorithms
E-mail:spitca@mmmut.ac.in
Phone:9235500533
HomePage:http://www.mmmut.ac.in/view?ab=9

Bio-Sketch: Prof. Shiva Prakash is working as Professor & Head, Department of Information Technology and Computer Application at Madan Mohan Malaviya University of Technology, Gorakhpur, U.P., India since June 2016 and worked as Associate Professor from Sept. 26, 2009 to June 4, 2026. He joined this institute in 2009. Prior to join worked as Assistant Professor at Kumaon Engineering College, Dwarahat. He has more than 25 Years of teaching and research experience. He did his Ph.D. from UTU Dehradun, Uttarakhand in 2012, M. Tech. (CSE) from MNNIT, Allahabad in 2006 and B.Tech. (CSE) from KEC Dwarahat, Uttarakhand in 1997. He supervised 3 Ph.D. theses, 23 M. Tech. dissertations and published more than 140 research articles in international journals and conference proceedings of repute. He is a reviewer of a few International Journals. His area of research includes Internet of Things, SDN, Blockchain, FOG & Cloud Computing, WSN, MANET, etc. He is a Member, IEEE, ISTE and ACM.

2. **Prof. Sarvpal Singh**

Designation, Qualifications: Professor
Areas of Interest: Wired/Wireless networking, Mobile & Cloud Computing, Linux O S
E-mail:spsitca@mmmut.ac.in
Phone:9235500532
HomePage:http://www.mmmut.ac.in/view?ab=9

Bio-Sketch: Prof. S.P. Singh is working as Professor, Department of Information Technology and Computer Application at Madan Mohan Malaviya University of Technology, Gorakhpur, U.P., India since June 2016. He has more than 29 Years of teaching and research experience. He did his Ph.D. from DDU Gorakhpur. He supervised one Ph.D. thesis and many M. Tech. dissertations and published more than 52 research articles in international journals and conference proceedings of repute.

3. **Prof. Umesh Chandra Jaiswal**

Designation, Qualifications: Professor
Areas of Interest:Natural Language Processing, Design and Analysis of Algorithms, Parallel Algorithms, Machine Learning
E-mail:ucjitca@mmmut.ac.in
Phone: 9235500528
Home Page:http://www.mmmut.ac.in/view?ab=9

Bio-Sketch: Prof. S.P. Singh is working as Professor, Department of Information Technology and Computer Application at Madan Mohan Malaviya University of Technology, Gorakhpur, U.P., India since June 2017. He has more than 34 Years of teaching and research experience. He did his Ph.D. from DDU Gorakhpur. He supervised one Ph.D. thesis and many M. Tech. dissertations and published more than 65 research articles in international journals and conference proceedings of repute.

4. Dr. Daya Shankar Singh

Designation, Qualifications: Associate Professor
Areas of Interest: Wired/Wireless Networks, IoT, Mobile and Cloud Computing, Algorithms
E-mail:dssitca@mmmut.ac.in
Phone: 9235500535
HomePage:ttp://www.mmmut.ac.in/view?ab=9

Bio-Sketch: Dr. Daya Shankar Singh is working as Associate Professor, Department of Information Technology and Computer Application at Madan Mohan Malaviya University of Technology, Gorakhpur, U.P., India. He has more than 23 Years of teaching and research experience. He did his Ph.D. from Uttarakhand Technical University Dehradun. He supervised many M. Tech. dissertations and published more than 35 research articles in international journals and conference proceedings of repute.

5. Dr. Jay Prakash

Designation, Qualifications: Associate Professor
Areas of Interest: Computer Science & Engineering
E-mail:jpitca@mmmut.ac.in
Phone: 9235500536
HomePage:http://www.mmmut.ac.in/view?ab=9

Bio-Sketch: He is working as Associate Professor, Department of Information Technology and Computer Application at Madan Mohan Malaviya University of Technology, Gorakhpur, U.P., India. He has more than 23 Years of teaching and research experience. He did his Ph.D. from Uttarakhand Technical University Dehradun. He supervised two Ph.D. theses, many M. Tech. dissertations and published more than 40 research articles in international journals and conference proceedings of repute.

6. Dr. Rajendra Kumar Dwivedi

Designation: Assistant Professor
Qualifications: Ph.D.
Areas of Interest: Blockchain, Internet of Things (IoT), Machine Learning, Deep Learning, Cloud Computing, Sensor Cloud, Wireless Sensor Networks, Social Network Analysis
E-mail:rkditca@mmmut.ac.in
Phone:9235501648
HomePage:https://sites.google.com/site/rkdcsmmmec/

Bio-Sketch: Dr. Rajendra Kumar Dwivedi is an Assistant Professor in the Department of Information

Technology and Computer Applications at Madan Mohan Malaviya University of Technology, Gorakhpur (U.P.), India. He joined this institute in 2009. He has received his B. Tech Degree (Honors) in 2004 from Pt Ravishanker Shukla University, Raipur and M. Tech. Degree (Honors) from Indian Institute of Technology (IIT), Roorkee in 2015. He has done his PhD from Madan Mohan Malaviya University of Technology, Gorakhpur (U.P.) in 2021 under supervision of Prof Rakesh Kumar (MMMUT Gorakhpur) and Prof R K Buyya (Redmond Barry Distinguished Professor and Director - CLOUDS Lab, The University of Melbourne, Australia; CEO- ManjrasoftPvt. Ltd). Before joining Madan Mohan Malaviya Engineering College (under state government of U.P.), he worked in K.V. Lansdowne U.K. (under central government of India). Currently he is having duties of Associate Dean (Student Affairs), Nodal Officer (Scholarship), Program Officer (NSS) along with various other University and Department level assignments. He is Executive Member in Intellectual Property Rights Cell, IT Resource Center, National Digital Library of India, and Library Affairs Management of MMMUT Gorakhpur. He has been nominated for Young Engineers Award in Institution of Engineers (India). He has revied one Letter of Appreciation from Hon'ble Governor of UP and 2 Letters of Appreciation from Hon'ble Vice Chancellor MMMUT Gorakhpur. He has received two Scholarship/Fellowship. He has supervised many PhD, M. Tech., MCA and B Tech students. He has published 1 Book and 21 Book Chapters. He has published 4 papers in International Transactions, 25 papers in International Journals, 65 papers in International Conferences and 12 papers in National Conferences of high repute. He has received one Best Paper Award at National level. Currently, he is having h-index=16, i-10 index=31, and citations=821. He is a member of IEEE and also life member of Institution of Engineers (India). He is Reviewer of various Web of Science and Scopus indexed International Journals as well as IEEE/Springer International Conferences.He has chaired 2 Sessions in IEEE International Conference and delivered 16 Expert Talks. His main research interests lie in Blockchain, Internet of Things (IoT), Machine Learning, Deep Learning, Cloud Computing, Sensor Cloud, Wireless Sensor Networks, and Social Network Analysis.

Laboratory Infrastructure

Each state-of-the-art laboratory is managed by a Faculty-In-Charge and a staff-in-charge and has the best-of-breed equipment's featuring Internet of Things (IoT), Cloud Computing, Blockchain, Machine Learning & Deep Learning, Artificial Intelligence, Neural Network, Social Networks, Web Semantic, Big data Analytics, Wireless Sensor Network, Natural Language Processing, Cryptography & Network Security.

Department of Chemical Engineering

5.7 Department of Chemical Engineeing

The department of Chemical Engineering started in the year 2016 with a total intake of 60 students and the first batch graduated in the year 2020. The department strives for the all-round development of students and nurtures them to cater to the needs of industry and society. Teaching and learning in department not restricted to the classroom and prepare them for industry and high academic carrier. We always strive to provide them life learning skills and as results of this more than of 15% student joined higher degree program at premium institutes of India like IIMs, IITs, NITs, etc. Two students received MEXT fellowship of Japanese government for higher education in Japan. One of the students joined as Assistant Scientific officer at IGCAR, Kalpakkam and two start their own firm. The department has always been on a progressive path, thanks to the experienced and dedicated faculty members who have a strong commitment towards providing quality engineering education and research. The Department has 4 regular faculty and 8 guest faculty. Faculty members of Chemical Engineering are recognized for their research and educational impact through their experiential skills. They are members of a variety of professional organizations. Our department is exponentially growing by leaps and bounds and our impact in chemical engineering education and research is poised for continual growth in the years ahead. All the faculty members are Doctoral degree holders and due to their efforts, two students who were enrolled in 2018 have been awarded with Ph.D. degree with an average time of four year and one student's thesis is under evaluation process. The chemical Engineering Faculty bagged two projects from SERB, New Delhi and one from CST, U.P. Among the three projects two have been completed successfully. Department have established research facility for synthesis of materials and their application in field of environmental radiation and energy field, with help from projects funds.

Program Offered

The Department offers 01 Undergraduate (UG) and Ph.D programmes.
To keep in pace with the current technological advancements, the UG and PG curriculum has been recently modified so that the students get a feel of what exactly is happening outside in the tech-world.

- B.Tech.-Chemical Engineering: 60 students-Eight Semesters-Choice Based Credit System
- Doctor of Philosophy (Ph.D.)

Areas of Research

Availability of clean energy and water are two major challenges with growing population. Our research focuses on the development of multifunctional hybrid materials for energy and environmental applications. Our thrust is on synthesizing materials following a greener route. We investigate different processes for these newly developed materials as photocatalysts for the treatment of wastewater, for advance separation process. Our prime focus is to develop sustainable processes which are synthesized via a green route, and cost-effective methods for clean energy and wastewater treatment application. Presently our faculty is undertaking research in following broad areas:

- Energy and Environment
- Wastewater Treatment.
- Advance separation Process
- Process Intensification
- Heat and Mass Transfer
- Polymer nanocomposite
- Process Intensification

- Sonochemistry
- Biochemical Engineering,
- Electrochemical oxidation
- New and Renewable Energy (Microbial Fuel Cell),

Faculty Profile

1. Prof. Vitthal L Gole

- **Designation,** Professor and Head of the Department
- **Qualifications:**

✓ Ph. D. (Tech.) (Chemical Engineering), ICT, Mumbai, MS (2013)
✓ M. Tech. (Chemical Engineering), Dr BATU, Lonere - Raigad, MS (2003)
✓ B.E. (Chemical Engineering), Amaravati University, MS (2000)

- **Areas of Interest:** Process Intensification, Sonochemistry, Advanced Oxidation Process
- **Fellowship Awarded:** 3
- Postdoctoral Research Associate at University of Arizona, Tucson, USA
- **M.Tech. Supervised**: 12
- **Ph.D Supervised**: 1 (Completed) + 5 (Ongoing)
- **Research Project:** 10
- **Patent:** **1**
- **E-mail:** vlgch@mmmut.ac.in
- **Phone:** +91-8765783815
- **Google Scholar:** https://scholar.google.co.in/citations?user=FTHjObYAAAAJ&hl=

Biosketch: Vitthal L. Gole completed his B.E. in Chemical Engineering from Amravati University, M. Tech. in Chemical Engineering from Dr. Babasaheb Ambedkar Technological University, Lonere-Raigad and Ph.D. (Tech) in Chemical Engineering from Institute of Chemical Technology, Mumbai. He has more than 17 teaching and research experience. He has 30 publications in international peer reviewed journals in his credit and more than 40 conference publications. He has received a research grant of Rs. 69 lacs from various funding agencies such as AICTE, IEI, etc. He has postdoctoral research experience at University of Arizona where he worked in association of US Airforce and solved their actual industrial problem on treatment of aqueous fire-fighting foams using large scale sonochemical reactor. His team developed the first kind of 91 L sonochemical reactor to treatment. His research interests include Process Intensification, Advanced oxidation processes and Biofuels. For his excellence in teaching and research AICTE horned him Career Award for Young Teacher in year 2013. Apart from teaching and research, he has organized several workshops, seminars, and conferences on advance topics for teachers and students. He served as secretary of UDCT Alumni Association Pune Chapter. Worked various position in academic administration such as Head- Chemical Engineering, Head-Pharmaceutical Science & Technology, Director-Internal Quality Assurance Cell, Associate Dean Digital Infrastructure, Deputy Coordinator- Admission Cell, Director (Ranking) Higher Education Department, UP State Government, etc. He completed several visits as NAAC Peer Team as Member Coordinator.

2. Dr. Ravi Shankar

- **Designation:** Assistant Professor
- **Qualifications:**

✓ Ph. D. (Tech.) (Chemical Engineering),
✓ IIT Roorkee (2014)
✓ M. Tech. (Chemical Engineering), IIT Roorkee (2010)
✓ B.Sc. Eng, (Chemical Engineering), BIT Sindri (2008)

- **Areas of Interest:** Energy and Environment, Biochemical Engineering, Chemical Reaction Engineering, Heat and Mass Transfer
- **Industrial Experience:** JWM, Ordinance Factory Nalanda, Rajgir (2.5 years)
- **Fellowship Awarded:** 2
- **Ph.D Supervised**: 3
- **Research Project:**2
- **E-mail:** rsch@mmmut.ac.in, bits.iitr@gmail.com
- **Google Scholar** https://scholar.google.com/citations?hl=en&user=Lxe_HBoAAAAJ

Bio-sketch: Dr. Ravi Shankar completed his master and Ph.D. from IIT Roorkee and Bachelor from BIT Sindri. Before joining the Madan Mohan Malaviya University of Technology in year 2016, he served in Ordinance Factory, Nalanda Rajgir for three years. His research interests include wastewater treatment and advanced oxidation processes. He has more than 45 international peer reviewed publications in his credit with citation index more than 800. He has received research funding from SERB, UPCST and completed several industrial projects. At present, he is working on several innovative projects. Apart from teaching and research, he is looking various responsibilities such as warden, joint controller of examination, coordinator RUSA, DDU-QIP, etc.

3. Dr. Prateek Khare

- Designation, Assistant Professor
- Qualifications:

✓ Ph. D. (Tech.) (Chemical Engineering), IIT Kanpur (2017)
✓ M. Tech. (Chemical Engineering), N.I.T Rourkela (2011)
✓ B. Tech., (Chemical Engineering), U.I.E.T C.S.J.M Kanpur (2009)

- Areas of Interest: Photocatalyst degradation, Electrochemical oxidation, Adsorption, New and Renewable Energy (Microbial Fuel Cell), Advance Separation Process (Electrochemical Reduction).
- Research Experience: Research Assistant, CSIR Project, MNIT Jaipur Rajasthan (1.3 years)
- Fellowship Awarded: 2
- Patent: 2
- Ph.D Supervised: 2
- Research Project: 3
- E-mail: pkch@mmmut.ac.in, ptkkhare@gmail.com
- Google Scholar:http://scholar.google.co.in/citations?user=Dd4rH58AA

Bio-sketch: Dr. Prateek Khare completed his Master and PhD from NIT Rourkela and IIT Kanpur and Bachelor from UIET, CSJM Kanpur. He served as a postdoctoral research fellow at NIT Jaipur. His research area includes Electrochemical oxidation, adsorption, microbial fluid and electrochemical reduction. He has received research funding from SERB and completed several projects in collaboration with industries. He has more than 40 publications in his credits in various international peer reviewed journals. He is serving

on many committees of academic functioning.

4 Dr. Jyoti

- Designation: Assistant Professor
- Qualifications:
- ✓ Ph. D. (Tech.) (Chemical Engineering), IIT Roorkee (2015)
- ✓ M. Tech. (Polymer Science), PU Chandigarh (2004)
- ✓ B. Eng, (Chemical Engineering), DCRUST, Murthal, Sonepat, Haryana (2002)
- Areas of Interest: Advanced oxidation Processes, Polymeric composites, Water treatment
- Fellowship Awarded: 4
- Ph.D. Supervised: 2
- Research Project: 1
- E-mail: jyotich@mmmut.ac.in,
- Google Scholar: https://scholar.google.com/citations?hl=en&user=9XoMhj8AAAAJ

Bio-sketch: Dr. Jyoti has more than 15 years of teaching and research experience at various prestigious institutions in India. She did his PhD from IIT Roorkee, Master from Panjab University and Bachelor from DCRUST. She has more than 10 publications in international peer reviewed journals and worked on several industrial projects. She is looking for various responsibilities apart from teaching and research.

Department of Humanities & Social Sciences

5.8 Department of Humanities & Social Sciences

Humanities & Social Science Department**,** Madan Mohan Malaviya University of Technology, Gorakhpur was established on 23.03.2023 after reconstituting the erstwhile Humanities & Management Science Department by separating the Humanities & Social Science and Managementwings into two separate independent departments with the view to expand the academic activities and programs in both the areas. The department has experienced and dedicated faculty members who have a strong commitment towards providing quality education and research in various areas of Humanities & Social Sciences. The Department has 06 faculty members, 01 Associate Professor, 02 Assistant Professors, 01 Visiting Faculty, and 02 Guest Faculties. Besides, the Department has 03 Research cum Teaching Fellows (RCTF) as well. All faculty members, except RCTF's, are Doctoral degree holders. With a pool of highly competent faculty members the department is striving ceaselessly to foster excellence and to open novel vistas in the various domains and sub domains of Humanities and Social Science by making outgoing talents industry ready. The department aims to generate human resources of excellent quality with proven professional, interpersonal skills to cater to local and global needs. Faculty at department gives specific focus to cultivate entrepreneurial skills amongst graduates, post-graduates, and doctoral scholars. In addition to academic and professional dedication, we at HSSD make sure that the philanthropic objectives of education remain intact.

Courses Offered

Currently, the Department offers only Ph.D. programs in English, Economics, and Psychology. The Ph.D. programme of the Department began in the academic year 2019-2020 with Economics stream. Later on, doctoral program was extended to English and Psychology subjects as well.

Areas of Research

English: Language&Literature, Literary Theories: Traditional, Modern & Post Modern; Linguistics, Translation Studies; Literary Research Methods; ELT & SLT: Bilingual Method & Second Language; ICT in ELT, World Literature & Comparative Studies, Soft Skills & Communication Studies; Kinesics; Film Studies & Text Screen Interphase

Faculty Profile

1.**Dr. Sudhir Narayan Singh**

Designation: Associate Professor and Head of theDepartment, HSSD, MMMUT, Gorakhpur
Qualifications: M.A. (English), Ph.D.
Areas of Interest: ELT, SLT, Communication Skillsand Soft Skills, American Literature, Feminist Studies, Indian Classics inTranslation
E-mail: snshms@mmmut.ac.in
Phone: 08765783849
Home Page:https://www.youtube.com/@SonofSoil

Bio-Sketch: Dr Sudhir Narayan Singh is a Banaras Hindu University alumnus, a bilingual poet, editor, critic, and short story writer. Dr Singh rendered his services at various reputed Indian Universities, Colleges & Institutes as English faculty and ELT-Trainer. Presently he is serving as Associate Professor & Head, Department of Humanities and Social Science, Madan Mohan Malaviya University of Technology, Gorakhpur, UP, India. Dr Singh also offered his services to visually challenged students.His prestigious international certifications include TESOL's ELT Leadership Management Certificate, the ELT Leadership Management Certificate Program conducted by TESOL International Association, Alexandria, Virginia, USA, January 19-21, 2017; and English Language Teachers' Summer Seminar 2018, by Department of

Continuing Education at Exeter College, University of Oxford, Oxford, UK, during July 22 — August 04, 2018 and many more. Dr Singh acted as resource person at HRDC-DDU GU, Gorakhpur; HRDCBPSWU, Sonipat; UGC-ASC, GJUS&T, Haryana. Attended over 100 national/international webinars/seminars/conferences; and chaired technical sessions in them including IIM-Banglore, BITS Pilani, SRM University and at other institutions of repute. His poems appeared in journals like Poets International, Rock Pebbles and anthologised in The Enchanted World, Poets' Paradise, The Fancy Realm and The Melodies of Immortality. He contributed 75 research articles which are widely published by Indian & foreign publishers and also edited 04 books Exploring Digital Humanities: Issues & Challenges; Post Feminism in India: Myth or Reality; Advanced Information Communication Technology in Engineering; and Kyon Jaroori Hain JaatiUnmoolan. He Co-authored 02 books Formal Letters, and Feminine Consciousness: Glimpsing Indian Perspectives. Moreover, He enabled 'first visually challenged student of the country to get admission to Faculty of Arts and Faculty of Social Sciences, B.H.U., Varanasi, India. Dr Singh awarded Shiksha Ratan Award by India International Friendship Society, New Delhi; and Global Professional Membership of TESOL, Alexandria, Virginia by RELO, US Embassy, New Delhi. He is Life Member of Association of English Studies of India and Osmania University Centre for International Program (Formerly American Study Research Centre-ASRC) Osmania University, Hyderabad.Dr Sudhir Narayan Singh is founder President, National Digital Library of India Club Madan Mohan Malaviya University of Technology (NDLI Club-MMMUT) Gorakhpur, and Founder President, The Finance Club, MMMUT, Gorakhpur. He is Vice-Chairman, Council of Student Activities (CSA) and Vice-President, CDC, MMMUT, Gorakhpur.

2. **Dr. Ravi Kumar Gupta**
Designation: Assistant Professor of Economics
Qualifications: M.A. (Economics), Ph.D.
Areas of Interest:Development Economics, Applied Econometrics
E-mail: rkghms@mmmut.ac.in 5. Phone: +91-9235552355
Home Page:http://mmmut.ac.in/view?ab=7

Bio-Sketch: Dr. Ravi Kumar Gupta is currently working as an Assistant Professor at the Department of Humanities and Social Sciences, Madan Mohan Malaviya University of Technology, Gorakhpur. He has completed his MPhil and Ph.D. in Economics from Pondicherry Central University, Puducherry. Banaras Hindu University, Varanasi, awarded him a master's degree in economics. His research papers are indexed in Scopus, ABDC, and ABS index. He has authored books and chapters with Taylor & Francis and other publishers. He has edited many worldwide books. Symbiosis Institute of Management Studies and the Indian Institute of Finance also honored him. He actively reviews many reputed journals indexed in Scopus, and ABDC, like Gender and Society and Applied Economics. He was a speaker at the United Nation University and Banaras Hindu University.

3. **Dr. Abhijit Mishra**

Designation: Assistant Professor of Psychology
Qualifications: M.A., Ph.D.
Areas of Interest: Positive Psychology, Organizational Behavior, Organizational Culture, Cultural Psychology
E-mail: amhms@mmmut.ac.in5. Phone: + 91-9235552357
Home Page:https://sites.google.com/view/abhijitmishra/home

Bio-Sketch: Dr Abhijit Mishra holds Doctoral degree in Psychology with specialization in Cultural Psychology and a Master's degree in Psychology, both from University of Delhi, Delhi and a Bachelor's degree in Psychology from Deen Dayal Upadhyay Gorakhpur University, Gorakhpur. He earned his Ph.D. on his thesis titled "Self Construal and the Experience & Consequence of Affective States". Prior to joining MMMUT, he worked at Ramanujan College, University of Delhi as an Assistant Professor for an academic year. His area of interest includes Cultural Psychology, Positive Psychology, and Organizational Behavior. Dr Mishra has delivered invited talks/ chaired technical sessions in various national/ international events. He has worked on Research Projects sponsored by Centre for Studies on Civilizations, New Delhi and Cluster Innovation Centre, University of Delhi. Dr. Mishra is a Member of National Academy of Psychology (NAoP), India and American Psychological Association (APA).

Laboratory Infrastructure:

The Department has two language labs namely (i) Language Lab- I, and (ii) Language Lab-II. The labs are equipped with Computers and software for English language training to help students to improve their English language communication skills.

Departmentof Mathematics and Scientific Computing

5.7 The Department Mathematics and Scientific Computing

The Department of Mathematics and Scientific Computing attained its present status of an independent department on 22nd June 2019. Prior to this department was constituent part of Applied Science Department, established in 1962. The department is committed to imparting effective teaching and quality research work in different areas of Mathematics and Scientific Computing. The faculty members of the department have expertise across areas of both pure and applied mathematics, such as Modern Algebra, Ring Theory, Operations Research, Inventory Control, Graph Theory, Numerical Analysis, Differential Equations, Special Functions and Mathematical Modelling. They have studied or worked at leading institutions across India, and their research is published in journals of high international repute. With 10 (01 Professor, 03 Associate Professor, 06 Assistant Professor) sanctioned post of faculty members, the Department is well-placed to offer a variety of courses and activities.

Courses Offered

- M.Sc. Mathematics (Specialization in Computing)
- Ph.D. in Mathematics

Besides this, the department also offers various courses of Mathematics to Undergraduate and Postgraduate students of different Engineering, Science, and management Departments of the university.

Faculty Profile

1.Dr. Harish Chandra

Designation, Qualifications: Assistant Professor, Ph.D.
Areas of Interest: Algebra / Solar Physics/ Cryptography
E-mail:hcmsc@mmmut.ac.in
Phone: +91-**9235501647**

HomePage:https://sites.google.com/site/harishchandra858/homehttps://orcid.org/0000-0001-5232-6043

Bio-Sketch: Dr. Harish Chandra holds a Doctoral Degree in Algebra from University of Lucknow in 2013. Presently, he is Assistant Professor in the department of Mathematics and Scientific Computing, Madan Mohan Malaviya University of Technology, Gorakhpur. His current area of research is Cryptography, Group Rings and its applications in Cryptography, and Solar Physics. He has published 30 papers in reputed International/National Journals. He is a life member of Indian Society of Mathematics, Indian Science Congress, and Bharat Ganita Parishad. He has been awarded RBS M mate Fellowship for getting first rank in his M.Sc. (Mathematics) previous.

2. Dr. Amit Kumar Barnwal

Designation, Qualifications: Assistant Professor, Ph.D.
Areas of Interest: Differential Equation/Numerical method Cryptography
E-mail: akbmsc@mmmut.ac.in
Phone: +91-9235501646
Home Page: https://scholar.google.co.in/citations?user=dJyORi8AAAAJ&hl=en

Bio-Sketch: Dr. Amit Kumar Barnwalhas completed his Ph.D. degree from Indian Institute of Technology, Kharagpur in 2013. His research area includes numerical methods, differential equations, and cryptography. Currently, he is working as Assistant Professor in the department of Mathematics and Scientific Computing, Madan Mohan Malaviya University of Technology, Gorakhpur. He has published 20 research articles in reputed International Journals. He is a life member of Indian Society of Mathematics.

3. Prof. V. K. Mishra

Designation, Qualifications: Professor , Ph.D.
Areas of Interest: Operations Research/Inventory Control/Supply Chain Management
E-mail: vkmmsc@mmmut.ac.in
Phone: +91-9235501647
HomePage:https://sites.google.com/view/vinod-mishrahttps://orcid.org/0000-0002-1680-4017

Bio-Sketch: Dr. V K mishracompletedhis Ph.D. degree from Dr. R M. L. Avadh University, Faizabad in 2011. His research area includes Operations Research, Inventory Control and Supply Chain Management. Currently, heis working as Professor & HEAD in the department of Mathematics and Scientific Computing, Madan Mohan Malaviya University of Technology, Gorakhpur. He has published 40 research articles in reputed International Journals.

Department of Physics and Material Science

5.10. The Department Physics and Material Science:

The Department of Physics and Material Science was established on 22nd June, 2019. Which has been inaugurated by Shri Yogi Adiyanath Ji Maharaj, Hon'ble Chief Minister of Uttar Pradesh. Previously, it has been the constituent part of Department of Applied Sciences since the inception of the erst while Madan Mohan Malaviya Engineering College, Gorakhpur.

The main objective of the department is to disseminate knowledge in the area of Physics and Material Science, in order to promote the implementation of practical aspects related to it and to build a solid foundation of physics for science and engineering students. The department has always been on a progressive path, with their experienced and dedicated faculty members who have a strong commitment towards providing quality science education and research. The Department has 03 faculty members, 02 Professors, 01 Assistant Professorsand 04 guest faculty members. All the faculty members are Doctoraldegreeholders.The department offers Ph. D. degree in Physics, with an objective to produce trained and skilled human resources, who can take the challenges to cater the need of the society. The research is focused to thrust areas as: Condensed Matter Physics, Solar Energy Physics, Thin Films, Opto-electronic Materials and devices, Photonics, Fiber Optic Sensors, Energy Storage, Applications of Nanomaterial, Micro & Nano-fluids, Molecular Simulation etc.

Courses Offered

The Department offers Postgraduate (PG) program M.Sc. Physics (Specialization in Electronics) and Ph.D program. This department has been offering the subjects in almost all the branches of the UG program of engineeringaccording to their requirements since inception of this institute in 1962. The Ph.D program in the subject of Physics has been offered by this department since 1962. The PG Physics with specialization in electronics was started in the year 2018. The courses/ subjects offered are ofhigh standard, many include advanced topics as per the need of academia and industries.In addition, the Department also offers high quality research programs at thedoctorallevel.To keep in pace with the current technological advancements, the UG and PGcurriculum is being reviewed continuously and modified accordingly so that the students get a feel of cutting-edge technology and research.

- M.Sc.- Physics with specialization in Electronics:30students–4 Semesters-
- Doctor of Philosophy (Ph.D.) in Physics.

Faculty Profile

1. Prof. D. K. Dwivedi

Designation: Professor, Head of Department of Physics and Material Science
Area of Interest: Amorphous Semiconductors, Optoelectronic Materials and Devices, SolarCell, Photonics (Surface Plasmon Sensors (SPR), Photonic Crystal Fiber (PCF), Optical Fiber Sensors), Energy Storage Devices.
Email: todkdwivedi@gmail.com, dkdpms@mmmut.ac.in
Phone: 09235500510, 06393817382
HomePage:http://www.mmmut.ac.in/FacultyList?ab=1
Link:
GoogleScholar:https://scholar.google.com/citations?user=InRtRcsAAAAJ&hl=en&oi=ao
Research Gate:https://www.researchgate.net/profile/Dk-Dwivedi
Scopus: https://www.scopus.com/authid/detail.uri?authorId=57191523703
ORCID ID: 0000-0002-8334-5535
Publications: 230 (SCI Index Journal papers)
39 (National Journal papers), 174 (Conference papers)

Citations- 3071, h-index-28, i10index-99

Bio-Sketch: Prof. D.K. Dwivedi is currently Professor and Head, Department of Physics and Material Science, Madan Mohan Malaviya University of Technology, Gorakhpur. He obtained his M.Sc. and Ph.D. from D.D.U. Gorakhpur University, Gorakhpur. He started his carrier as Scientific Officer in Bhabha Atomic Research Centre, Mumbai in 2001. He has served as Lecturer in Physics, D.D.U. Gorakhpur University for nearly 8 years. He joined as Reader in Madan Mohan Malaviya University of Technology, Gorakhpur in 2009. He has 230 publications in International Journals, 39 papers in National journals and 174 Conference papers to his credit. He has delivered 42 invited lectures. He has authored five books. Prof. Dwivedi has supervised 12 Doctoral thesis and 5 are in progress. He has supervised 26 M.Sc/ M.Tech students in dissertation project. He has been awarded three major research projects. He has organized ten national level conferences/Workshops/short term courses. His area of interest is Amorphous Semiconductors, Nano Structured Materials, Energy storage devices (Li-ion batteries), Solar cell devices and Photonic Crystal Fiber sensors. He has served at almost all the administrative positions such as Head of Physics and Material Science Department, Dean of Undergraduate studies and Entrepreneurship, Dean of Post Graduate Studies and Research and Development, Dean of Faculty Affairs, Chairman Administrative Committee, Chairman Recruitment Cell, Chairman Board of Studies,Chairman Departmental Purchase Committee, Member of Board of Management, Member Secretary IQAC, Member Space Advisory Committee, Member Examination Committee, Member University Admission Committee, Member University Student Grievance Redressal Committee, QIP Co-ordinator, Chairman Council of Student Activities, Member of Project Monitoring Unit RUSA, Member Research and Consultancy Management Committee,Member Flexible Cadre Structure, Member of Board of Studies of different Universities, officiating Vice Chancellorand many more. He is Editor in 10 reputed journals and Referee in more than 57 International journals. He has 3 national patents. He is a member of 6 academic societies/Professional body and associations of National as well as international level. He is life fellow of Optical Society of India.

2. Prof. B. K. Pandey

Designation, Qualifications: Professor, D.Phil.
Areas of Interest: Nanomaterials and Nanofluid, SolarCell, Molecular modeling using DFT, and Condensed Matter Physics.
Email:bkpmmmec11@gmail.com,bkppms@mmmut.ac.in
Phone:9415244487, 923550051
HomePage:http://www.mmmut.ac.in/FacultyList?ab=1
Link: Google Scholar:https://scholar.google.com/citations?user=eTDRQJMAAAAJ
Research Gate:https://www.researchgate.net/profile/Brijesh-Pandey-7
Scopus: https://www.scopus.com/authid/detail.uri?authorId=7102018593
ORCID ID: 0000-0002-7999-4743
Publications:44 (SCI Index Journal papers)
11 (National Journalpapers), 70 (Conference papers)
Citations- 497, h-index-11, i10index-12

Bio-Sketch: Prof. B. K. Pandey is Professor in the Department of Physics and Material Science, at Madan Mohan Malaviya University of Technology, Gorakhpur, India. He has teaching and administrative experience of more than 24 years in his university. He has served at almost all the administrative positions such as Head Applied Science, Founder Head Physics and Material Science, Chairman council of student activities, and Coordinators of different committees in the university. His research interests are in the areas of thermophysical properties of nanomaterials, thermal conductivity of nanofluids, solar cell and Molecular

modelling using first principle. He has published 128 research papers in the peer reviewed research journals of international repute. He has also authored 21 books published from international publishers like Cengage learning and Pearson and edited 3 books. 3rd edition of his most popular book on engineering Physics has been released by Hon'ble Governor and minister of technical education of U.P. during 8th convocation of his university. He has an illustrious record in guiding P. G. and Ph. D. theses. He has supervised 05 Ph.D. Students and dissertation theses of 22 Post Graduate students. One international patent has been granted by Republic of Germany, one national patentis published and two national patents are in process to be granted in his credit.

3. **Dr. S.P. Singh:**

Designation, Qualifications: Assistant Professor, Ph.D.
Areas of Interest: Condensed Matter Physics & Nanoscience (Experimental & Theoretical), Functional Surfaces and Interfaces, Nanomaterials, Molecular Physics, Density Functional Theory
E-mail:spspms@mmmut.ac.in; singh.satyapal.pmsd@gmail.com; singh.satyapal@hotmail.com
Phone:9450422506,8765783656
HomePage:http://www.mmmut.ac.in/FacultyList?ab=1
Home Page:https://www.mmmut.ac.in/view?ab=1
Research Publications: 65 (45 SCI Indexed) H-Index: 10Citations: 252
Conferences: Int. 30 Nat. 20
Books: 02 International Books
Book Chapters: 01 International
Projects: 01
ResearchGate Link:https://www.researchgate.net/profile/Satya-Singh-46
GoogleScholar Link:https://scholar.google.com/citations?hl=en&user=grYCpxgAAAAJ

Bio-Sketch: Dr. Satya Pal Singh was born in January 1977 in a village in Gorakhpur district of Uttar Pradesh. His education up-to high school was completed at Kasia in Kushinagar district. He completed his secondary education from M G Inter College, Gorakhpur. He obtained bachelor's in science degree from Deen Dayal Upadhyay Gorakhpur University. He obtained his Master of Science degree in Physics from Jamia Millia Islamia Central University, New Delhi in the year 1999 and was placed at first rank. He completed Pre-Ph. D and pursued research work at School of Physical Sciences, Jawaharlal Nehru University, New Delhi. He later joined at Dr. Ram Manohar Lohia Awadh University and received his Ph.D Degree in Physics in the year 2008. He has worked as a research scientist at molecular simulation and statistical thermodynamics laboratory at department of chemical engineering, Indian Institute of Technology, Kanpur for the period of August 2007 to June 2009. He joined the erstwhile MMM Engineering College on 03 July 2009. The college became an autonomous college in the year 2010 and a state technical university in the year 2014. Dr. Singh has more than 16 years of teaching and research experience. He has published more than 65 research papers in reputed national and international journals. He has participated and presented his work at 40 National and International Conferences. He has also graced conference events as session chair and co-chair on many occasions. He has published two books and one book chapter. Dr. Singh obtained UGC Visitor Grant for staying and pursuing research work at IUCAA, Pune in the year 2010. He obtained Summer Research Fellowship in the year 2012 and 2015 jointly given by the three premier science academies of India; IASc, INSA and NASI and pursued research work at IISc, Bengaluru for two months. Dr. Singh organized 3-days workshop on "Nanotechnology and Its Applications" 18-20 January 2013 financially supported by the three premier academies of science. Apart

of that Dr. Singh has organized faculty development programmes in the years 2017, 2022 and 2023. He has organized Science Exhibition cum Lecture workshops on National Science Day for many years. Dr. Singh has been engaged in teaching Engineering Physics, Space Science and Nanotechnology subjects to B.Tech students since 2010. He has been engaged in teaching Condensed Matter Physics, Computational Technique and Programming and Statistical Mechanics and Thermodynamics to M.Sc Physics students since the year 2018. Dr. Singh has served as paper setter at different universities as MMM University of Technology, DDU Gorakhpur University, Dr. R M L Awadh University, Integral University, Lucknow University, Dr. A. P. J. Abdul Kalam Technical University, Lucknow, Maharaja SurajmalBrij University, Bharatpur, Rajastahan apart of National Testing Agency (NTA), New Delhi, India. He has served as member of Board of Studies and Departmental Research Committee for many years He has reviewed research papers for prestigious international journals as Scientific Report (Nature), Journal of Physics and Chemistry of Solids, IEEE Transactions on Nanotechnology, Computing in Science and Engineering, International Journal of Nano Dimension and many more. He received Major Research Grant of UGC, New Delhi for the period of three years (2013-2016). He has supervised 25 MSc, 03 M.Tech and 03 Ph. D students. He was awarded Elsevier Peer Reviewer Recognition award 2020. He is member of the editorial boards of European Journal of Physics Education, Turkey and Frontiers of Soft Matter (Liquid Crystal) Switzerland. He has been awarded as Outstanding Researcher in Physics Award of 2023 by Veenus International Foundation, Chennai, India. He is life member of Indian Physics Society. Dr. Singh has also been active in popularization of science. He has been recently received “Poorvanchal Gaurav Samman” for excellence in teaching and social service conferred by Poorvanchal Gaurav SammanSamiti, Lucknow.

Laboratory Infrastructure:
Each state-of-the-art laboratory is managed by a Faculty-In-Charge and a staff-in-charge and has the best-of-breed equipment Differential Scanning Calorimetry, UV- Visible Spectrophotometer, Vacuum Coating Unit, Impedance analyser, centrifuge, thermal conductivity of nano fluid, Sonicator, vacuum pump, Server station for molecular modelling and software of density functional theory.

Photonics and Amorphous Research Lab:
The Photonics and Amorphous Research Lab in the department of Physics and Material Science, Madan Mohan Malaviya University of Technology, Gorakhpur focuses on scientific studies in the broad area of Optoelectronic devices. We are currently engaged in synthesizing materials for phase-change memory and further characterize them by analysing their optical, thermal, and electrical properties. Simulations and modelling in the field of solar cells, energy storage devices, sensor applications using COMSOL, SCAPS, MATLAB are also carried out for optimizing various parameters for specific applications. Following facilities are available in our research laboratory:
1. Spin Coating System, NXGP1
2. Shimadzu UV-2600 Spectrophotometer, AC UV-2600
3. Differential Scanning Calorimeter, DSC-60 Plus
4. UV-Vis Double Beam Spectrophotometer, UV5704SS, 2012
5. High Vacuum Unit for Ampoule Sealing, Vacuum Tech. Pvt. Ltd. Bangalore, VT-2015, 2012
6. Thermal evaporation film deposition Vacuum unit Co.,Delhi, Q-5247VT-2015,2012
7. Digital Weighing Machine
8. Autoclave Teflon Beaker (200ml and 100ml)
9. Magnetic Stirrer 3 port, Labsol
10.Drying Oven, REMI RDHO-80
11.Centrifuge, REMI PR-24
12. Shimadzu FTIR Spectrophotometer, FTIR-8400S
13. Furnace (temp. upto 800 C)
14.I-V Source unit, Keysight, B2910BL (10fA 1ch)
15. LCR meter, Keysight, E4980AL (20 Hz-1MHz)
16. HP i-7 Desktop Computers (Qty. 02)
This laboratory is extensively used by research scholars and PG students of different departments of this university.

Nanofluid Research Laboratory: The focus of the Nanofluid Research Laboratory in the department of Physics and Material Science, Madan Mohan Malaviya University of Technology, Gorakhpur hasbeenthedevelopment and use for scientific studies in the broad area of condensed matter Physics. This lab is dedicated to the synthesis and characterization of nanoparticles using chemical and green synthesis techniques. Using these nanoparticles nanofluids are prepared and their thermal conductivities are measured for their better applications in the heat and mass transfer, especially in coolant technology. In the same laboratory computational and modelling facilities are available for Solar cell and other energy storage devices, which suggests the potential material candidates in the field of solar cell and batteries. This laboratory is extensively used by research scholars and PG students of different departments of this university. Following facilities are available in our research laboratory:

- High Vacuum Pump for drying Cat. No. FD-12, HHV Pumps Pvt Ltd.
- Temperature controlled Magnetic Stirrer with hot plate, C-MAG, HS 7 Package Indent No. 0009015922, IKA India, Pvt. Ltd. Germany.

- Hot air Oven NSW-143 OVEN UNIVERSALSize605 X 605 X 605 mm Ltr 224 Model, OUA-5
- Digital Ultrasonic Cleaner(Sonicator) Make; Wensar / ITL –Mumbai /Narang Scientific Works
- Electronic Balance Model HPB 20, Make.Wansar instrument
- Thermal Conductivity measuring instrument based on ultrasonic interferometer (Common facility to department)
- Centrifuge system.

Condensed Matter Physics and Nanoscience Research Laboratory:

- High-end blade servers for computing DELL Power Edge R530 with Dual Processor 12 Cores (Qty. 02)
- High end blade servers for computing DELL Power Edge R530 Single Processor 06 Cores. (Qty. 01)
- Dell Optilex i-7 Computer (Qty. 01)
- HP i-7 Desktop Computers (Qty. 01)
- HP 1005 3-in-1 Laser Printer (Qty. 01)
- Microtek Online UPS for uninterrupted power supply with more than one hour backup. (Qty. 01)
- AMBER-2020 Molecular Dynamic simmulation, DFT via Gaussian Software
- Hot Plate Magnetic Stirrer with digital control panel Max RPM 1500, Max Temp. 200 Glassco Laboratory Pvt. Ltd. (Qty. 01)
- Hot Air Oven, 200^0C, Omega. (Qty. 01)
- Necessary Glassware for Molecular-Self-Assembly (SAM) method.

Note: All the research facilities available in each lab are equally extendible to Ph.D. students working in the department.

Electronic Devices and Circuit lab: Thislabpertainsto UG/PG students for experiments related to digital hardware kits. The lab is well equipped with digital trainer kits, digital storage oscilloscopes, function generators, and integrated circuit testers which are used by students to perform hardware experiments related to digitalelectronics.

Condensed Matter PhysicsLab: Thislabpertainsto PG students for experiments related to contents of the condensed matter Physics.Experiments related to courses including crystallographic structure of the materials, electrical, magnetic and nuclear properties of the materials.

Spectroscopic and Laser Lab: The lab helps students of PG for carrying out theirexperimental work to clarify the theory discussed the course of atomic, molecular physics and laser. The equipment of this laboratory are mainly concerned with the spectroscopy and laser. Some special equipment of this laboratory are also dedicated to the solar cell and nuclear magnetic resonance to impart the better knowledge to the students of postgraduation.

Computational Technique and Programming:

Computational Laboratory equipped with i-7 desktop computers, ITRC, MMM University of Tehcnology

Optoelectronics and Optical Communication Lab:

Optical networks are rapidly emerging due to the enormous bandwidth provided by theopticalmedium. Study of Light Dependent Resistor (LDR), Photo Transistor, Photodiode, Opto-Coupler, Numerical aperture measurement of single mode and multi-mode fiber, Measurement of bending loss and splice loss in multi-mode fiber, Calculation of normalized frequency or V-number of single mode fiber, Calculation of mode field diameter of single mode fiber.

Keeping in pace with the rapid development in technology, courses like Optical fiber and ComputerCommunication are being taught in the final year at the P.G. Level and Opticaldata processing at the P.G. level. The lab is being built to provide research facilitiesto the P.G. students.

Analogue and Digital Communication:
The Lab curriculum has been designed so that students are able to gain hands-on experience using modern testing equipment, technology, and MATLAB software. The objective of these lab courses is to learn how to generate and process analog and digital communication signals using signal processing algorithms in Matlab and the trainers' boards, which use aunique block diagram approach for building experiments. Observe and interpret the impact of channel impairments such as noise, power limitation and finite bandwidth on different communication. LDR for modulation and demodulation measurement.

Microprocessor and Microcontroller Lab:
The lab is well equipped with trainerkitspertaining to 8085 microprocessors to perform various operations through coding.

Department of Chemistry & Environmental Science

5.11. TheDepartment Chemistry & Environmental Science

Department of Chemistry & Environmental Science is the new emerging academic department of MMMUT, Gorakhpur. The department was established on June 22, 2019, and inaugurated by GorakshaPithadish Param Pujya Sri Yogi Adityanath Ji Maharaj, the Honorable Chief Minister of Uttar Pradesh under the visionary leadership of renowned academician and technocrat Professor Sri Niwas Singh, Hon'ble Vice Chancellor of Madan Mohan Malaviya University of Technology, Gorakhpur. The Department is committed to fostering a respectful workplace culture and strives to cultivate a safe, inclusive, and fair environment where staff, faculty, researchers, and students canthrive as they advance new chemical frontiers through research, innovation, collaboration, and scholarship. As the nascent upcoming department, the pivotal focus is to cater to the academic and research requirements of the budding engineers and basic science researchers. It's vision is to become a leading university department by conducting quality research in the area of Chemical Science and Environmental Science and offer solutions to the problems organic, inorganic, physical, industrial, analytical chemistry and also solving ecological, environmental problems under the guidance of highly qualified academic team. Apart from imparting quality education to various graduation courses, the department offers Ph. D. in Chemistry as well. The Department of Chemistry & Environmental Science provides a unique focus for addressing some of today's most pressing environmental and chemical problems. Additional opportunities for joint research are available with our colleagues at the premier Indian Institute of Department of Chemistry, Indian Institute of Technology, New Delhi, as well as the International Institute at the Korea Research Institute of Chemical Technology, South Korea. The department's research is supported by grants and contracts from government sources, with principal strengths in polymeric materials, artificial photosynthesis, molecular modeling, and environmental analysis.

Courses Offered

1. The department offers Postgraduate (PG) course in Chemistry
2. The department offers Ph.D. programs in Chemistry.

Area of Research:

Presentlyourfacultyisundertakingresearchin the followingbroadareas:

- Polymer Chemistry and waste-water treatment
- Synthesis of polymers and composite materials and their applications. Development of new materials for waste-water treatment.

Artificial Photosynthesis

- Artificial photosynthesis b. A New Paradigm for Harnessing Solar Energy in the Synthesis of Chiral Chemicals Synthesis of Amino acids and Biodegradable plastic through artificial photosynthesis.

Faculty Profile

1. Prof. P. P. Pande

Designation, Qualifications: Professor and Head of the Department, Ph.D.
Areas of Interest: Polymer Chemistry, Waste-water treatment
E-mail:pppches@mmmut.ac.in, pppande@gmail.com
Phone:+91-9235500513
Home Page: http://www.mmmut.ac.in/view?ab=10

Bio-Sketch: Dr. P. P. Pande is a Professor in the Department of Chemistry and Environmental Science Technology, Gorakhpur, U.P. India. Dr. Pande has guided 3 Ph.D. thesis and more than 15 M.Sc. theses. He has published more than 50 research papers in reputed International Journals. His research interests are in the areas of development of efficient and low-cost polymer- based adsorbants for removing toxic metals and dyes from waste-water.

2. Prof. Rajesh Kumar Yadav

Designation, Qualifications: Professor, Ph.D.
Areas of Interest: a. Artificial photosynthesis
b. New Paradigm for Harnessing Solar Energy in the Synthesis of Chiral Chemicals
c. Synthesis of Amino acids and Biodegradable plastic through artificial photosynthesis,
E-mail:rkyches@mmmut.ac.in, rajeskr_yadav2003@yahoo.co.in
:Mobile: +91-9765783846
HomePage:http://www.mmmut.ac.in/view?ab=10

Bio-Sketch: Dr. Yadav is a Professor in the Department of Chemistry and Environmental Science Technology, Gorakhpur, U.P. India. Dr. Yadav has guided 4 Ph.D. thesis and more than 21 M.Sc. theses. He has published more than 110 research papers in reputed International Journals and 40 national and international patents. His research interests are in the areas of development of a cheap and efficient light-active photocatalyst that could be utilized for the production of hydrogen, oxygen, and solar fuel chemicals from water using CO_2.

Laboratory Infrastructure

Each state-of-the-art laboratory often consists of various pieces of equipment and is managed by a team of experts.

UV-Visible Spectrophotometer: This instrument is used to measure the absorption and transmission of light in the ultraviolet and visible regions of the electromagnetic spectrum. It is often used in chemistry and biology for quantitative analysis.

Fourier Transform Infrared Spectroscopy (FTIR): FTIR spectroscopy is a technique that analyzes the interaction of infrared light with matter. It is used for identifying chemical compounds and studying their structures.

Gel Permeation Chromatogram (GPC): GPC is a type of chromatography used for separating and characterizing macromolecules, such as polymers, based on their size and molecular weight.

Rotavapour (Rotary Evaporator): A rotary evaporator is used for the gentle evaporation of solvents, typically in chemical laboratories. It's commonly used for concentration and purification of samples.

Electrochemical Workstation: This equipment is used for studying electrochemical reactions. It often includes a potentiostat/galvanostat for controlling and monitoring electrochemical processes.

Tubular Muffle Furnace (1200°C): A muffle furnace is a high-temperature oven used for various applications, including heat treatment, ashing, and annealing of materials.

Centrifuge (-25°C): Centrifuges are used to separate particles from liquids by applying centrifugal force. Temperature control may be essential for specific applications, such as the separation of temperature-sensitive samples.

Millipore Water Plant: A Millipore water purification system produces high-quality water for laboratory use, including deionized or ultrapure water, which is essential for many experiments.

Ice Flakes: Ice flake machines produce small, uniform ice flakes that are often used in laboratories for cooling or maintaining a consistent temperature in various applications.

These pieces of equipment are essential for various scientific and research purposes and are commonly found in advanced laboratories where precise measurements, analysis, and experiments are conducted. The management structure you mentioned, with a Faculty-In-Charge and a staff-in-charge, is typical in academic or research settings to oversee the operation and maintenance of the laboratory.

Department of Management Studies

5.12 Department of Management Studies

About Department

The Management Studies Department, Madan Mohan Malaviya University of Technology (formerly Madan Mohan Malaviya Engineering College) was established in the year 2023 (Primarily known as Center for Management Studies established in 2001). Theprimary objectives of the management studies department are to impart broad basedknowledge in the field of management practices and their application in addressing the challenges of the emerging global business environment and society.

Vision of the Department

To create and disseminate knowledge in the core and allied areas of Business Management in order to develop professional competence and managerial skills to shape up outstanding professionals.

Mission of the Department

To open nascent avenues for studies and Research at the various academic levels in the emerging field of Business Management.To develop professionals with decisive ability to initiate and manage change. To generate human resources of excellent quality with professional, interpersonal, and scientific skills for managing local and global needs. To cultivate entrepreneurial skills amongst graduates, post- graduates', and doctoral scholars. To develop soft skills of budding managers in order to increase employability.

Courses Offered

The Department offers 01 Undergraduate (UG- BBA) and 01 Postgraduate (PG) i.e. MBA with Dual Specialization and Ph.D. programs for Management.

Master's in business administration

The MBAprogram was started in 2001. Initially the department was offering 3 specializations but now it is offering 07 specializations. The students' intake for MBA course is 75.
List of Specialization offering in MBA:

- Human Resource Management (HR)
- Marketing (MK)
- Finance Management (FM)
- Information Technology (IT)
- International Business (IB)
- Entrepreneurship (ED)
- Operation Management (OP)

Bachelor's in business administration

The Undergraduate (UG- BBA) program started in 2019. The students' intake for BBA course is 75.

Ph.D. in Management
Presently our faculty is undertaking research in following broad areas:

- Human Resource Management
- Financial Management
- Marketing
- Operation Management
- Entrepreneurship etc.

Other relevant areas

To keep in pace with the current technological advancements, the UG and PG curriculum has been modified time to time also many new subjects were added which ultimately enhance the skill of budding managers and provide them a look what exactly is happening outside in the tech-world.

Faculty Profile

1. Er. Bijendra Kumar Pushkar
Assistant Professor
Areas of Interest: IT, Marketing and Finance
E-mail: bkpmba@mmmut.ac.in
Phone:8381912495
Home Page: http://mmmut.ac.in/view?ab=13
Biosketchs: Er. Bijendra Kumar Pushkar is Assistant Professor in Management Studies Department, M.M.M. University of Technology Gorakhpur (Accredited "A" by NAAC). He obtained his Master of Business Administration (Finance & Marketing-2012) from Jiwaji University, Gwalior and Bachelor of Engineering (Electronics & Communication-2010) from RGPV, Bhopal. He is UGC NET (Management) qualified. He has 10+ year of teaching & Research experience. He has various research publications and research articles in national and international journals, edited books, and conference proceedings in relevant field of management and engineering.

2. Dr. Ugrasen
Assistant Professor
Areas of Interest: Finance, Capital Market, Entrepreneurship Development, Economics Accounting & Marketing.
E-mail: umba@mmmut.ac.in
Phone: 9532960122
Home Page: http://mmmut.ac.in/view?ab=13
Biosketchs: Dr. Ugrasen is Assistant Professor in Management Studies Department, M.M.M. University of Technology Gorakhpur (Accredited A+ by NAAC). He obtained his Ph.D. Degree in Management (Finance-2018), Master of Business Administration (Finance & Marketing-2007), Master of Commerce (Finance &Accounting-2005) and Bachelor of Commerce (Account & Marketing-2003) from DeenDayalUpadhyay Gorakhpur University, Gorakhpur (Accredited A++ by NAAC). He was awarded with "Rajiv Gandhi National Fellowship" by UGC Delhi in 2013. He has 10+ year of teaching & Research experience and more than 6 years of experience with corporate with Networth Stock Broking, PNB MetLife, Bajaj Capital &Karvy Stock Broking Ltd. He has various research publications and research articles in national and international journals, edited books, and conference proceedings in field of Capital Market, Mutual Funds, Banking, Insurance and other contemporary issues in Management and Commerce.

3.Dr. Priyanka Rai

Assistant Professor

Area of Interest: Human Resource, Managerial Economics, Finance, Accounting, Indian Economics.

Email:prmba@mmmut.ac.in

Phone- 8318552978

Home Page:http://mmmut.ac.in/view?ab=13

Biosketchs: Dr. Priyanka Rai is presently working as Assistant Professor (since 1 st December 2018) in Department of Management Studies, Madan Mohan Malaviya University of Technology, and Gorakhpur. She worked as Assistant Professor (from 9 Sept.2013 to 30 November 2018), Department of Business Administration in Nehru Gram Bharati University, Civil lines campus. Allahabad, U.P.-221505.She also worked as H.R Executive in Via Media Health, sector-62, Noida (U.P.). She did her Ph.D. (Role of Microfinance In Women Empowerment), from Nehru Gram Bharati University, Allahabad (U.P.) in 2018. She completed her M.B.A 1st Division from Shri Ramswroop Memorial Engineering and Management College, Lucknow (U.P.), affiliated to UPTU, Lucknow. She did her B.B.A 1 ST Division from City College of Management, Lucknow affiliated to Lucknow University. She completed her M.A Economics 1 st division from UPRTOU, Allahabad (U.P.) in the year 2020. She completed her M. Com 1 st division from UPRTOU, Allahabad (U.P.) in the year 2018. She did her Intermediate 1 st division with PCB and High school:1st division with science stream From CBSE Board , Army school, Gorakhpur

4.Dr. Bharti Shukla

Assistant Professor

Area of Interest: Marketing, Services Marketing, CRM, Human Resource, Operations

Email: bsmba@mmmut.ac.in

Phone- 8318309525

Home Page: http://mmmut.ac.in/view?ab=13

Google Scholar Page:https://scholar.google.com/citations?hl=en&user=4nO--eMAAAAJ

Biosketchs: Dr. Bharti Shukla is Assistant Professor in Management Studies Department. She obtained her B.Sc. degree in Mathematics Stream by CSJM University Kanpur. She obtained her **Ph.D. Degree in Management**, Master of Commerce from DeenDayalUpadhyay Gorakhpur University, Gorakhpur (Accredited A++ by NAAC), and**Master of Business Administration (HRM & Marketing)** from Madan Mohan Malaviya University of Technology (MMMEC), UPTU.She is NET in Management. She worked as Investor Relationship Officer. She has more than 10 years of research experience and lifetime membership of Indian Accounting Association. She received **the Best Researcher Award** by INSPIRA research association 2022. She also has more than 13 years of teaching experience. She has various publications with indexed international journals in the field of marketing, HRM and various contemporary issues in Management. She reviews many reputed journals indexed in Scopus, and ABDC, like FIIB (Sage), Journal of Consumer studies (Wiley) etc. She was invited as resource person in various Seminar, FDP and Workshop.

Laboratory Infrastructure: The Department has one computer lab. The lab is equipped with Computers and software for management students to help students to improve their skills.
Classroom and other facilities- The department has three classrooms. Two classrooms have audio visual facilities with projector and other relevant equipments. Department have one conference hall and one seminar hall.

6 SYLLABUS FOR WRITTEN TEST

6. SYLLABUS FOR WRITTEN TEST:

The entrance test shall consist of 100 multiple choice questions. There shall be no negative marking. 50 questions shall be based on **Research Aptitude/Methodology** which shall include quantitative methods/ computer applications, experimental techniques etc. and 50 questions shall be **subject specific**. The test shall be of **Three hours**. Candidates securing 50% or above of the average marks of the top 5 candidates shall be eligible to be called for the interview. The weightage of marks in the entrance test and interview will be in the ratio of 70% and 30%, respectively, for preparing the merit in a particular specialization. The total number of candidates called for interview in each specialization will be ordinarily three times (if more candidates are available) of the available seats in the respective department/specialization. The eligible candidates will be admitted in a particular department/ specialization on the basis of cumulative merit (both test and interview), and as per the availability of faculty members in the department. A relaxation of 5% marks will be allowed in the entrance examination for the candidates belonging to SC/ST/OBC (non-creamy layer)/ /differently-abled category and Economically Weaker Section (EWS) as per UGC Gazette notification CG-DL-E-07112022-240086 dated November 7, 2022.

The syllabus for the entrance test is as follows:

Part A: Research Aptitude/Methodology (Common to all departments)
Note:
(i)Equal number of questions are to be set from each Unit.

Unit-1 Research Aptitude
Research: Meaning, Types, and Characteristics, Positivism and Post-positivist approach to research. Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.Steps of Research.Thesis and Article writing: Format and styles of referencing.Application of ICT in research.Research ethics.

Unit-2 Comprehension & Communication
A passage of text is given. Questions are asked from the passage to be answered. Communication: Meaning, types and characteristics of communication. Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication. Barriers to effective communication. Mass-Media and Society.

Unit-3 Mathematical Reasoning and Aptitude
Types of reasoning, Number series, Letter series, Codes and Relationships, Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.), Logical Reasoning: Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition. Evaluating and distinguishing deductive and inductive reasoning. Analogies.Venn diagram: Simple and multiple use for establishing validity of arguments.

Unit-4 Data Interpretation
Sources, acquisition and classification of Data, Quantitative and Qualitative Data, Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data, Data Interpretation, Data and Governance.

Unit-5 Information and Communication Technology (ICT)
ICT: General abbreviations and terminology, Basics of Internet, Intranet, E-mail, Audio and Video-conferencing, Digital initiatives in higher education.ICT and Governance.

Part B: Department Specific Subject: Civil Engineering

Section 1:

Linear Algebra: Matrix algebra; Systems of linear equations; Eigen values and Eigen vectors.

Calculus: Functions of single variable; Limit, continuity and differentiability; Mean value theorems, local maxima and minima; Taylor series; Evaluation of definite and indefinite integrals, application of definite integral to obtain area and volume; Partial derivatives; Total derivative; Gradient, Divergence and Curl, Vector identities; Directional derivatives; Line, Surface and Volume integrals.

Ordinary Differential Equation (ODE): First order (linear and non-linear) equations; higher order linear equations with constant coefficients; Euler-Cauchy equations; initial and boundary value problems.

Section 2

Partial Differential Equation (PDE): Fourier series; separation of variables; solutions of one-dimensional diffusion equation; first and second order one-dimensional wave equation and two-dimensional Laplace equation.

Probability and Statistics: Sampling theorems; Conditional probability; Descriptive statistics – Mean, median, mode and standard deviation; Random Variables – Discrete and Continuous, Poisson and Normal Distribution; Linear regression.

Numerical Methods: Error analysis. Numerical solutions of linear and non-linear algebraic equations; Newton's and Lagrange polynomials; numerical differentiation; Integration by trapezoidal and Simpson's rule; Single and multi-step methods for first order differential equations.

Section 3

Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Frictions and its applications; Centre of mass; Free Vibrations of undamped SDOF system.

Solid Mechanics: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, Transformation of stress; buckling of column, combined and direct bending stresses.

Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

Section 4

Construction Materials and Management: Construction Materials: Structural Steel – Composition, material properties and behaviour; Concrete - Constituents, mix design, short-term and long-term properties. Construction Management: Types of construction projects; Project planning and network analysis - PERT and CPM; Cost estimation.

Concrete Structures: Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete beams.

Steel Structures: Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Concept of plastic analysis - beams and frames.

Section 5

Soil Mechanics: Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Seepage through soils – two - dimensional flow, flow nets, uplift pressure, piping, capillarity, seepage force; Principle of effective stress and quicksand condition; Compaction of soils; One-dimensional consolidation, time rate of consolidation; Shear Strength, Mohr's circle, effective and total shear strength parameters, Stress-Strain characteristics of clays and sand; Stress paths.

Foundation Engineering: Sub-surface investigations - Drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes – Finite and infinite slopes, Bishop's method; Stress distribution in soils – Boussinesq's theory; Pressure bulbs, Shallow foundations – Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations – dynamic and static formulae, Axial load capacity of piles in sands and clays, pile load test, pile under lateral loading, pile group efficiency, negative skin friction.

Section 6

Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum and energy equations and their applications; Potential flow, Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth; Concept of lift and drag.

Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, hydraulic jump, uniform flow, gradually varied flow and water surface profiles.

Section 7

Hydrology: Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, reservoir capacity, flood estimation and routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's Law.

Irrigation: Types of irrigation systems and methods; Crop water requirements - Duty, delta, evapo-transpiration; Gravity Dams and Spillways; Lined and unlined canals, Design of weirs on permeable foundation; cross drainage structures.

Section 8

Water and Wastewater Quality and Treatment: Basics of water quality standards – Physical, chemical and biological parameters; Water quality index; Unit processes and operations; Water requirement; Water distribution system; Drinking water treatment.

Sewerage system design, quantity of domestic wastewater, primary and secondary treatment. Effluent discharge standards; Sludge disposal; Reuse of treated sewage for different applications.

Air Pollution: Types of pollutants, their sources and impacts, air pollution control, air quality standards, Air quality Index and limits.

Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

Section 9

Transportation Infrastructure: Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments.

Geometric design of railway Track – Speed and Cant.

Concept of airport runway length, calculations and corrections; taxiway and exit taxiway design.

Highway Pavements: Highway materials - desirable properties and tests; Desirable properties of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible and rigid pavement using IRC codes.

Traffic Engineering: Traffic studies on flow and speed, peak hour factor, accident study, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Traffic signs; Signal design by Webster's method; Types of intersections; Highway capacity.

Section 10

Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves.

Photogrammetry and Remote Sensing - Scale, flying height; Basics of remote sensing and GIS.

Part B: Department Specific Subject: Computer Science Engineering Department

Section 1:

Engineering Mathematics Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders, and lattices. Monoids, Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions. Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LU decomposition. Calculus: Limits, continuity, and differentiability. Maxima and minima. Mean value theorem. Integration. Probability and Statistics: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem. Computer Science and Information Technology

Section 2:

Digital Logic Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

Section 3:

Computer Organization and Architecture Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining, pipeline hazards. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Section 4:

Programming and Data Structures Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Section 5:

Algorithms Searching, sorting, hashing. Asymptotic worst-case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph traversals, minimum spanning trees, shortest paths

Section 6:

Theory of Computation Regular expressions and finite automata. Context-free grammar and push-down automata. Regular and contex-free languages, pumping lemma. Turing machines and undecidability.

Section 7:

Compiler Design Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation. Local optimization, Data flow analyses: constant propagation, liveness analysis, common sub expression elimination.

Section 8:

Operating System System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems.

Section 9:

Databases ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Section 10:

Computer Networks Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuit-switching; Data link layer: framing, error detection, Medium Access Control, Ethernet bridging; Routing protocols: shortest path, flooding, distance vector and link state routing; Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT); Transport layer: flow control and congestion control, UDP, TCP, sockets; Application layer protocols: DNS, SMTP, HTTP, FTP, Email.

Part B: Department Specific Subject: Electrical Enginering

Unit1: Engineering Mathematics

Linear Algebra: Matrix Algebra, Systems of linear equations, Eigen values, Eigen vectors. Calculus: Mean value theorems, Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima, Multiple integrals, Fourier series, Vector identities, Directional derivatives, Line integral, Surface integral, Volume integral, Stokes's theorem, Gauss's theorem, Divergence theorem, Green's theorem.Differential equations: First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's equation, Euler's equation, Initial and boundary value problems, Partial Differential Equations, Method of separation of variables.Complex variables: Analytic functions, Cauchy's integral theorem, Cauchy's integral formula, Taylor series, Laurent series, Residue theorem, Solution integrals. Probability and Statistics: Sampling theorems, Conditional probability, Mean, Median, Mode, Standard Deviation, Random variables, Discrete and Continuous distributions, Poisson distribution, Normal distribution, Binomial distribution, Correlation analysis, Regression analysis.

Unit2: Electric Circuits, Networks Analysis & Synthesis

Network elements, ideal voltage and current sources, dependent sources, R, L, C elements; Network solution methods: KCL, KVL, Node and Mesh analysis; Network Theorems: Thevenin's, Norton's, Superposition, Maximum Power Transfer, Reciprocity, Compensation, Millman's and Tellegen's theorems for both dc and ac circuits; Transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, two port networks, balanced three phase circuits, star-delta transformation, complex power and power factor in ac circuits, graph theory; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Two-port networks, parameters, driving pointand transferfunctions;Network synthesis; Filters; Attenuators.

Unit3: Electromagnetic Field Theory

Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Effect of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations; Maxwell'sequations:differentialandintegralformsandtheirinterpretation, boundary conditions, wave equation.

Unit 4: Signals and Systems

Causal systems, Fourier series representation of continuous and discrete time periodic signals, sampling theoremandapplications, Applications of Fourier Transform for continuous and discrete time signals, Laplace Transform and Z transform. R.M.S. value, average value calculation for any general periodic waveform

Unit5: Electrical Machines

Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three-phase transformers: connections, vector groups, parallel operation; Auto-transformer, Electromechanical energy conversion principles; DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, speed control of dc motors; Three-phase induction machines: principle of operation, types, performance, torque-speed characteristics, no-load and blocked-rotor tests, equivalent circuit, starting and speed control; Operating principle of single-phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance and characteristics, regulation and parallel operation of generators, starting of synchronous motors; Types of losses and efficiency calculations of electric machines.

Unit 6: Power Systems

Basic concepts of electrical power generation, ac and dc transmission concepts, Models and performance of transmission lines and cables, Economic Load Dispatch (with and without considering transmission losses), Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Bus admittance matrix, Gauss- Seidel and Newton-Raphson load flow methods, Voltage and Frequency control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential, directional and distance protection; Circuit breakers, System stability concepts, Equal area criterion.

Unit7: Control Systems

Mathematical modelling and representation of systems, Feedback principle, transfer function, Block diagrams and Signal flow graphs, Transient and Steady-state analysis of linear time invariant systems, Stability analysis using Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci, Lag, Lead and Lead-Lag compensators; P, PI and PID controllers; State space model, Solution of state equations of LTI systems.

Unit8: Electrical and Electronic Measurement & Instrumentation

Bridges and Potentiometers, Measurement of voltage, current, power, energy, and power factor; Instrument transformers, Digital voltmeters and multi-meters, Phase, Time, and Frequency measurement; Oscilloscopes, Error analysis, Transducers: Type, classification and applications, Measurement of non-electrical quantities.

Unit 9: Analog and Digital Electronics

Simple diode circuits: clipping, clamping, rectifiers; Amplifiers: biasing, equivalent circuit and frequency response; oscillators and feedback amplifiers; operational amplifiers: characteristics and applications; single stage active filters, Active Filters: Sallen Key, Butterwoth, VCOs and timers; Number systems; Boolean algebra, minimization of functionsusing Boolean identities and Karnaugh map; Logic gates; Combinatorial and sequential logic circuits, multiplexers, demultiplexers, Schmitt triggers, sample and hold circuits, A/D and D/A converters.

Unit 10: Power Electronics

Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT; DC to DC conversion: Buck, Boost and Buck-Boost Converters; Single and three-phase configuration of uncontrolled rectifiers; Voltage and Current commutated Thyristor based converters; Bidirectional ac to dc voltage source converters; Magnitude and Phase of line current harmonics for uncontrolled and thyristor based converters; Power factor and Distortion Factor of ac to dc converters; Single-phase and three-phase voltage and current source inverters, sinusoidal pulse width modulation.

Part B: Department Specific Subject: Electronics and Communication Engineering Department

Unit 1: Engineering Mathematics

Linear Algebra: Vector space, basis, linear dependence and independence, matrixalgebra, eigen values and eigenvectors, rank solution of line are quations–existence and uniqueness.

Calculus: Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series.

Differential Equations: First order equations (linear and non linear), higher orde linear differential equations, Cauchy's and Euler's equations, method so solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems.

Vector Analysis: Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems.

Integral formula; Taylor's and Laurent's series, residue theorem.

Numerical Methods: Solution of nonlinear equations, single and multi-step methods for differential equations, convergence criteria.

Probability and Statistics: Mean, median, mode and standard deviation; combinatorial probability, probability distribution functions - binomial, Poisson, exponential andnormal; Joint and conditional probability; Correlation and regression analysis.

Unit 2: Networks, Signals and Systems

Network solution methods: nodalandmesh analysis; Network theorems: super position, the venin and Norton’s, maximum power transfer; Wye-Delta transformation; Steady statesinusoidal analysis usin gphasors; Time domain analysis of simple linear circuits; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Linear 2-port network parameters: driving point and transfer functions; State equations for networks.

Continuous time signals: Fourier series and Fourier transformer presentations, sampling the oremand applications; Discrete-time signals: discrete-time Fouriertransform (DTFT), DFT, FFT, Z-transform, interpolation of discrete-time signals; LTIsystems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay, digital filter designtechniques.

Unit3: Electronic Devices

Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell; Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.

Unit 4: Analog Circuits

Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing,bias stability, mid-frequency small signal analysis and frequency response; BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; Simpleop-ampcircuits; Activefilters; Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations; Function generators, wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: ripple removal andregulation.

Unit 5: Digital Circuits

Number systems; Combinatorial circuits: Boolean algebra, minimization of functionsusing Boolean identities and Karnaugh map, logic gates and their static CMO Simplementations, arithmetic circuits, code

converters, multiplexers, decoders and PLAs; Sequential circuits: latches and flip-flops, counters, shift-registers and finite state machines; Data converters: sample and hold circuits, ADCs and DACs; Semi conductor memories:ROM, SRAM, DRAM; 8-bitmicroprocessor(8085):architecture,programming, memory and I/Ointer facing.

Unit 6: Control Systems

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode androot-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation fLTI systems.

Unit 7: Communications

Random processes: autocorrelation and power spectral density, properties of white noise,filteringofrandomsignals through LTI systems;Analog communications :amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne receivers,circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem; Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phaseand frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation bandwidth, SNR and BER for digital modulation; Fundamental so ferrorcorrection, Hammingcodes;Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.

Unit 8: Electro magnetics

Electrostatics; Maxwell'sequations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector; Plane wave properties reflection and refraction, polarization, phase and groupvelocity, propagation through various media, skindepth; Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smithchart; Waveguides: modes, boundaryconditions, cut-off frequencies, dispersion relations; Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays; Basics of radar; Light propagation in optical fibers.

Part B: Department Specific Subject: Mechanical Engineering

1. Applied Mechanics and Design Syllabus

Engineering Mechanics carries a few topics that are an essential part of the GATE Mechanicalexam, including:

- Free-body diagrams and Equilibrium
- Trusses and frames
- Virtual work
- Impulse and momentum (linear and angular) and energy formulations, collisions
- Kinematics and dynamics of particles and rigid bodies in plane motion

Engineering Materials

- Structure and properties of engineering materials
- Phase diagrams
- Heat treatment
- Stress-strain diagrams for engineering materials

Mechanics of Materials

Mechanics of Materials focuses on the deformation of solid materials and the quantitative description of the motion. The mechanics of Material section of the GATE Mechanical syllabus 2023 carries the given topics: Stress and Strain, Elastic constants, Bending and shear stresses, Poisson's ratio, Deflection of beams, Mohr's circle for plane stress and plane strain, Torsion of circular shafts, Shear force and bending moment diagrams, Euler's theory of columns, thin cylinders, Thermal stresses, Energy methods, Strain gauges and rosettes, testing of materials with the universal testing machine, Testing of hardness and impact strength.

Theory of Machines

Theory of Machines subjects deal with the study of relative motion between the elements of a machine and the relative forces that act on them. The subtopics covered in this topic of the GATE Mechanical syllabus include:

- Displacement, velocity, and acceleration analysis of plane mechanisms
- Dynamic analysis of linkages
- Cams
- Gears and gear trains
- Flywheels and governors
- Balancing of reciprocating and rotating masses
- Gyroscope

Vibration

The vibrations subject of the GATE syllabus for Mechanical Engineering 2023 deals with the oscillating motion of elastic bodies and their relative forces. It includes Free and forced vibration of a single degree of freedom systems, the effect of damping, Vibration isolation, Resonance, Critical speeds of shafts, and Machine Design.

Machine Design

Machine design deals with the application of engineering mechanics and the Strength of materials during the planning stage of various machine elements like clutches, bearings, springs, gears, brakes, etc. The subtopics of this topic include.

- Design for static and dynamic loading
- Failure theories
- Fatigue strength and the S-N diagram
- Principles of the design of machine elements such as bolted, riveted and welded joints
- Shafts, springs, gears, rolling and sliding contact bearings, brakes, and clutches.

2. Fluid Mechanics & Thermal Sciences

Fluid Mechanics

- Fluid properties
- Fluid statics, manometry, and buoyancy, forces on submerged bodies, the stability of floating bodies
- Control-volume analysis of mass, momentum, and energy
- Fluid acceleration
- Differential equations of continuity and momentum
- Bernoulli's equation
- Dimensional analysis
- The viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends, and fittings.

Thermodynamics

- Thermodynamic systems and processes
- Properties of pure substances, the behavior of ideal and real gases
- Zeroth and first laws of thermodynamics, calculation of work and heat in various processes
- The second law of thermodynamics
- Thermodynamic property charts and tables, availability and irreversibility
- Thermodynamic relations
- Power Engineering
- Air and gas compressors
- Vapour and gas power cycles, concepts of regeneration and reheat. I.C.
- Engines: Air-standard Otto, Diesel, and dual cycles
- Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles
- Properties of moist air, psychrometric chart, basic psychrometric processes
- Turbomachinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines
- Heat-Transfer
- Modes of heat transfer
- One-dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins
- Unsteady heat conduction, lumped parameter system, Heisler's charts
- Unsteady heat conduction, lumped parameter system, Heisler's charts
- Thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, the effect of turbulence.
- Heat exchanger performance, LMTD and NTU methods
- Radiative heat transfer, Stefan-Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis

Finite Element Method

Types of elements:1D, 2D and 3D, Node numbering, Location of nodes

Introduction to the stiffness (Displacement) method: Introduction, Derivation of stiffness matrix, Derivation of stiffness matrix for a spring element, Assembly the total stiffness matrix by superposition. One-Dimensional Elements-Analysis of Bars and Trusses, Linear interpolation polynomials in terms of local coordinate's for1D, 2Delements. Higher order interpolation functions for 1D quadratic and cubic elements in natural coordinates, Constant strain triangle, Four-Nodded Tetrahedral Element (TET 4), Eight-Nodded Hexahedral Element (HEXA 3 8), 2D iso-parametric element, Lagrange interpolation functions.

Numerical integration: Gaussian quadrature one point, two point formulae, 2D integrals. Force terms: Body force, traction force and point loads, Numerical Problems: Solution for displacement, stress and strain in 1D straight bars, stepped bars and tapered bars using elimination approach and penalty approach.

Beams and Shafts: Boundary conditions, Load vector, Hermite shape functions, Beam stiffness matrix based on Euler-Bernoulli beam theory, Examples on cantilever beams, propped cantilever beams, Numerical problems on simply supported, fixed straight and stepped beams using direct stiffness method with concentrated and uniformly distributed load.

Torsion of Shafts: Finite element formulation of shafts, determination of stress and twists in circular shafts.

Part B: Department Specific Subject: Information Technology and Comuputer Application

Section 1: **Engineering Mathematics**

Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Monoids, Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions.

Linear Algebra: Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LU decomposition. Calculus: Limits, continuity and differentiability. Maxima and minima. Mean value theorem. Integration.

Probability and Statistics: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem.

Computer Science and Information Technology

Section 2: Digital Logic Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

Section 3: Computer Organization and Architecture Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining, pipeline hazards. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Section 4: Programming and Data Structures Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Section 5: Algorithms Searching, sorting, hashing. Asymptotic worst-case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph traversals, minimum spanning trees, shortest paths

Section 6: Theory of Computation Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and contex-free languages, pumping lemma. Turing machines and undecidability.

Section 7: Compiler Design Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation. Local optimisation, Data flow analyses: constant propagation, liveness analysis, common sub expression elimination.

Section 8: Operating System System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems.

Section 9: Databases ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Section 10: Computer Networks Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuit-switching; Data link layer: framing, error detection, Medium Access Control, Ethernet bridging; Routing protocols: shortest path, flooding, distance vector and link state routing; Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT); Transport layer: flow control and congestion control, UDP, TCP, sockets; Application layer protocols: DNS, SMTP, HTTP, FTP, Email.

Part B: Department Specific Subject: Chemical Engineering

Process Calculations and Thermodynamics

Steady and unsteady state mass and energy balances including multiphase, multi-component, reacting and non-reacting systems. Use of tie components; recycle, bypass and purge calculations; Gibb's phase rule and degree of freedom analysis. First and Second laws of thermodynamics. Applications of first law to close and open systems. Second law and Entropy. Thermodynamic properties of pure substances: Equation of State and residual properties, properties of mixtures: partial molar properties, fugacity, excess properties, and activity coefficients; phase equilibria: predicting VLE of systems; chemical reaction equilibrium.

Fluid Mechanics and Mechanical Operations

Fluid statics, surface tension, Newtonian and non-Newtonian fluids, transport properties, shell balances including differential form of Bernoulli equation and energy balance, equation of continuity, equation of motion, equation of mechanical energy, Macroscopic friction factors, dimensional analysis and similitude, flow through pipeline systems, velocity profiles, flow meters, pumps and compressors, elementary boundary layer theory, flow past immersed bodies including packed and fluidized beds, Turbulent flow: fluctuating velocity, universal velocity profile and pressure drop.

Particle size and shape, particle size distribution, size reduction and classification of solid particles; free and hindered settling; centrifuge and cyclones; thickening and classification, filtration, agitation and mixing; conveying of solids.

Heat Transfer

Equation of energy, steady and unsteady heat conduction, convection and radiation, thermal boundary layer and heat transfer coefficients, boiling, condensation and evaporation; types of heat exchangers and evaporators and their process calculations; design of double pipe, shell and tube heat exchangers, and single and multiple effect evaporators.

Mass Transfer

Fick's laws, molecular diffusion in fluids, mass transfer coefficients, film, penetration and surface renewal theories; momentum, heat and mass transfer analogies; stage-wise and continuous contacting and stage efficiencies; HTU & NTU concepts; design and operation of equipment for distillation, absorption, leaching, liquid-liquid extraction, drying, humidification, dehumidification and adsorption, membrane separations (micro-filtration, ultra-filtration, nanofiltration and reverse osmosis).

Chemical Reaction Engineering

Theories of reaction rates; kinetics of homogeneous reactions, interpretation of kinetic data, single and multiple reactions in ideal reactors, kinetics of enzyme reactions (MichaelisMentenand Monod models), non-ideal reactors; residence time distribution, single parameter model; non-isothermal reactors; kinetics of heterogeneous catalytic reactions; diffusion effects in catalysis; rate and performance equations for catalyst deactivation

Instrumentation and Process Control

Measurement of process variables; sensors and transducers; P&ID equipment symbols; process modeling and linearization, transfer functions and dynamic responses of various systems, systems with inverse response, process reaction curve, controller modes (P, PI, and PID); control valves; transducer dynamics; analysis of closed loop systems including stability, frequency response, controller tuning, cascade, and feed forward control.

Part B: Department Specific Subject: English

Unit –I: Drama
Unit –II: Poetry
Unit –III: Fiction, short story
Unit –IV: Non-Fictional Prose
NOTE: The first four units must also be tested through comprehension passages to assess critical reading, critical thinking and writing skills. These four units will cover all literatures in English.
Unit –V: Language: Basic concepts, theories, and pedagogy. English in Use.
Unit –VI: English in India: history, evolution, and futures
Unit –VII: Cultural Studies
Unit –VIII: Literary Criticism
Unit –IX: Literary Theory post World War II
Unit –X: Research Methods and Materials in English

Part B: Department Specific Subject: Economics

Unit-1 Micro Economics

Theory of Consumer Behaviour, Theory of Production and Costs, Decision making under uncertainty; Attitude towards Risk, Game Theory - Non Cooperative games, Market Structures, competitive andnon-competitive equilibria and their efficiency properties, Factor Pricing, General EquilibriumAnalysis, Efficiency Criteria: Pareto-Optimality, Kaldor- Hicks and Wealth Maximization, WelfareEconomics: Fundamental Theorems, Social Welfare Function. Asymmetric Information: AdverseSelection and Moral Hazard

Unit-2 Macro Economics

National Income: Concepts and Measurement, Determination of output and employment: Classical&Keynesian Approach, Consumption Function, Investment Function, Multiplier and Accelerator, Demand for Money, Supply of Money, IS - LM Model Approach, Inflation and Philips Curve Analysis; Business Cycles, Monetary and Fiscal Policy, Rational Expectation Hypothesis and its critique.

Unit-3 Statistics and Econometrics

Probability Theory: Concepts of probability, Distributions, Moments, Central Limit theorem; Descriptive Statistics - Measures of Central tendency & dispersions, Correlation, Index Numbers; Sampling methods &Sampling Distribution, Statistical Inferences, Hypothesis testing, LinearRegression Models and their properties -BLUE, ldentification Problem, Simultaneous EquationModels - recursive and non-recursive, Discrete choice models, Time Series Analysis.

Unit-4 Growth and Development Economics

Economic Growth and Economic Development, Theories of Economic Development: Adam Smith, Ricardo, Max, Schumpeter, Rostow, Balanced &Unbalanced growth, Big Push approach. Models ofEconomic Growth: Harrod-Domar, Solow, Robinson, Kaldor, Technical progress- Disembodied &embodied; endogenous growth, Indicators of Economic Development: PQLI, HDI, SDGs; Poverty andInequalities Concepts and Measurement, Social Sector Development: Health, Education, Gender.

Unit-5 Indian Economy

Economic Growth in India: Pattern and Structure, Agriculture: Pattern &Structure of Growth, MajorChallenges, Policy Responses, Industry: Pattern &Structure of Growth, Major Challenges, PolicyResponses, Services: Pattern & Structure of Growth, Major Challenges, Policy Responses, RuralDevelopment - Issues, Challenges &Policy Responses, Urban Development- Issues, Challenges and Policy Responses; Foreign Trade: Structure and Direction, BOP, Flow of Foreign Capital, TradePolicies, Infrastructure Development: Physical and Social; Public-Private Partnerships, Reforms inLand, Labour and Capital Markets, Centre-State Financial Relations and Finance Commissions ofIndia, FRBM, Poverty, Inequality & Unemployment

Part B: Department Specific Subject: Psychology

Unit-1 Emergence of Psychology

Psychological thought in some major Eastern Systems: Bhagavad Gita, Buddhism, Sufism and Integral Yoga. Academic psychology in India: Pre- independence era; post-independence era; Western: Greek heritage, medieval period and modern period. Structuralism, Functionalism, Psychoanalytical, Gestalt, Behaviorism, HumanisticExistential, Transpersonal, Cognitive revolution, Multiculturalism; Fourfounding paths of academic psychology - Wundt, Freud, James, Dilthey; Issues: Crisis in psychology due to strict adherence to experimental/analytical paradigm (logical empiricism); Indic influences on modernpsychology.Essential aspects of knowledge paradigms: Ontology, epistemology, and methodology; Paradigms of Western Psychology: Positivism, Post-Positivism,Critical perspective, Social Constructionism, Existential Phenomenology, andCo-operative Enquiry; Significant Indianparadigms on psychological knowledge: Yoga, Bhagavad Gita, Buddhism,Sufism, and Integral Yoga.

Unit-2 Research Methodology and Statistics

Research: Meaning, Purpose, and Dimensions; Research problems, Variables and Operational Definitions, Hypothesis, Sampling; Ethics in conducting and reporting research; Paradigms of research: Quantitative, Qualitative, Mixed methods approach; Methods of research: Observation, Survey [Interview, Questionnaires],Experimental, Quasi-experimental, Field studies, Cross-Cultural Studies,Phenomenology, Grounded theory, Focus groups, Narratives, Case studies,Ethnography; Statistics in Psychology: Measures of Central Tendency and Dispersion; Normal Probability Curve. Parametric [t-test] and Non-parametric tests [SignTest, Wilcoxon Signed rank test, Mann-Whitney test, Kruskal-Wallis test, Friedman]; Power analysis. Effect size; Correlational Analysis: Correlation [Product Moment, Rank Order], Partialcorrelation, multiple correlation; Special Correlation Methods: Biserial, Point biserial, tetrachoric, phi coefficient; Regression: Simple linear regression, Multiple regression. Factor analysis: Assumptions, Methods, Rotation and Interpretation.Experimental Designs: ANOVA [One-way, Factorial], Randomized BlockDesigns, Repeated Measures Design, Latin Square, Cohort studies, Timeseries, MANOVA, ANCOVA. Single-subject designs.

Unit-3 Psychological Testing

Types of tests; Test construction: Item writing, item analysis; Test standardization: Reliability, validity and Norms; Areas of testing: Intelligence, creativity, neuropsychological tests, aptitude,Personality assessment, interest inventories; Attitude scales – Semantic differential, Staples, Likert scale; Computer-based psychological testing; Applications of psychological testing in various settings: Clinical,Organizational and business, Education, Counseling, Military and Careerguidance.

Unit-4 Biological Bases of Behavior

Sensory systems: General and specific sensations, receptors and processes; Neurons: Structure, functions, types, neural impulse, synaptic transmission; Neurotransmitters; The Central and Peripheral Nervous Systems – Structure and functions; Neuroplasticity; Methods of Physiological Psychology: Invasive methods – Anatomicalmethods, degeneration techniques, lesion techniques, chemical methods, microelectrode studies; Non-invasive methods – EEG, Scanning methods; Muscular and Glandular system: Types and functions; Biological basis of Motivation: Hunger, Thirst, Sleep and Sex; Biological basis of emotion: The Limbic system, Hormonal regulation of behavior; Genetics and behavior: Chromosomal anomalies; Nature-Nurturecontroversy [Twin studies and adoption studies]

Unit-5 Attention, Perception, Learning, Memory and Forgetting

Attention: Forms of attention, Models of attention; Perception:Approaches to the Study of Perception: Gestalt and physiological approaches; Perceptual Organization: Gestalt, Figure and Ground, Law of Organization; Perceptual Constancy: Size, Shape, and Color; Illusions; Perception of Form, Depth and Movement; Role of motivation and learning in perception; Signal detection theory: Assumptions and

applications; Subliminal perception and related factors, information processing approachto perception, culture and perception, perceptual styles, Pattern recognition,Ecological perspective on perception.LearningProcess:Fundamental theories: Thorndike, Guthrie, Hull; Classical Conditioning: Procedure, phenomena and related issues; Instrumental learning: Phenomena, Paradigms and theoretical issues;Reinforcement: Basic variables and schedules; Behaviour modification andits applications; Cognitive approaches in learning: Latent learning, observational learning; Verbal learning and Discrimination learning; Recent trends in learning: Neurophysiology of learning; Memory and Forgetting; Memory processes: Encoding, Storage, Retrieval, Stages of memory: Sensory memory, Short-term memory (Workingmemory), Long-term Memory (Declarative -Episodic and Semantic;Procedural); Theories of Forgetting: Interference, Retrieval Failure, Decay, Motivatedforgetting

Unit-6 Thinking, Intelligence and Creativity

Theoretical perspectives on thought processes: Associationism, Gestalt,Information processing, Feature integration model; Concept formation: Rules, Types, and Strategies; Role of concepts in thinking; Types of Reasoning; Language and thought; Problem solving: Type, Strategies, and Obstacles; Decision-making: Types and models; Metacognition: Metacognitive knowledge and Metacognitive regulation; Intelligence: Spearman; Thurstone; Jensen; Cattell; Gardner; Stenberg;Goleman; Das, Kar &ParrilaCreativity: Torrance, Getzels& Jackson, Guilford, Wallach & Kogan; Relationship between Intelligence and Creativity.

Unit-7 Personality, Motivation, Emotion, Stress and Coping

Determinants of personality: Biological and socio-cultural; Approaches to the study of personality: Psychoanalytical, Neo-Freudian,Social learning, Trait and Type, Cognitive, Humanistic, Existential, Transpersonal psychology; Other theories: Rotter's Locus of Control, Seligman's Explanatory styles,Kohlberg's theory of Moral development; Basic motivational concepts: Instincts, Needs, Drives, Arousal, Incentives,Motivational Cycle; Approaches to the study of motivation: Psychoanalytical, Ethological, S-R, Cognitive,Humanistic; Exploratory behavior and curiosity; Zuckerman's Sensation seeking; Achievement, Affiliation and Power; Motivational Competence; Self-regulation; Flow; Emotions: Physiological correlates; Theories of emotions: James-Lange, Canon-Bard; Schachter and Singer; Lazarus, Lindsley; Emotion regulation; Conflicts: Sources and types; Stress and Coping: Concept, Models, Type A, B, C, D behaviors, Stressmanagement strategies [Biofeedback, Music therapy, Breathing exercises,Progressive Muscular Relaxation, Guided Imagery, Mindfulness, Meditation,Yogasana, Stress Inoculation Training].

Unit-8 Social Psychology

Nature, scope and history of social psychology; Traditional theoretical perspectives: Field theory, Cognitive Dissonance,Sociobiology, Psychodynamic Approaches, Social Cognition; Social perception [Communication, Attributions]; attitude and its changewithin cultural context; prosocial behavior; Group and Social influence [Social Facilitation; Social loafing]; Socialinfluence [Conformity, Peer Pressure, Persuasion, Compliance, Obedience, Social Power, Reactance]; Aggression; Group dynamics, leadership style andeffectiveness. Theories of intergroup relations [Minimal Group Experimentand Social Identity Theory, Relative Deprivation Theory, Realistic ConflictTheory, Balance Theories, Equity Theory, Social Exchange Theory]; Applied social psychology: Health, Environment and Law; Personal space,crowding, and territoriality.

9. Human Development and Interventions

Developmental processes: Nature, Principles, Factors in development, Stages of Development; Successful aging; Theories of development: Psychoanalytical, Behavioristic, and Cognitive; various aspects of development: Sensory-motor, cognitive, language, emotional, social and moral; Psychopathology: Concept, Mental Status Examination, Classification, Causes; Psychotherapies: Psychoanalysis, Person-centered, Gestalt, Existential,Acceptance Commitment Therapy, Behavior therapy, REBT, CBT, MBCT, Playtherapy, Positive psychotherapy, Transactional Analysis, Dialectic behaviortherapy, Art therapy, Performing Art Therapy, Family therapy; Applications of theories of motivation and learning in School;

Factors in educational achievement; Teacher effectivenessGuidance in schools: Needs, organizational set up and techniques; Counseling: Process, skills, and techniques.

Unit-10 Organizational Behavior

Meaning and development of OB, Concept and significance of OB, Need forOrganizational Behavior, Contributing disciplines, Challenge and opportunities for OB, Models of OB; Motivation: Meaning, Types and Theories (Content and Process theories); Learning:Concept and Characteristics, Principles, models of learning, Brief Idea of Components ofLearning Process; Attitudes: Concept and Characteristics, Factors, and Measures of Changing Attitudes; Perception: Components, factors influencing perception process; Personality: Determinants, theories, measurement; Leadership: meaning, style, models of leadership, Organizational Culture;Organizational Change and development; Group formation, Group Cohesiveness and development, inter-group conflict, Nature, process andresolution techniques; the nature and types of team, creating effective team, dysfunctions of groupand team, Communication process, meaning, barriers and methods to overcome barriers.

Part B: Department Specific Subject: Department of Mathematics & Scientific Computing

Analysis: Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum. Sequences and series, convergence, limsup, liminf. Bolzano Weierstrass theorem, Heine Borel theorem. Continuity, uniform continuity, differentiability, mean value theorem. Sequences and series of functions, uniform convergence. Riemann sums and Riemann integral, Improper Integrals. Monotonic functions, types of discontinuity, functions of bounded variation, Lebesgue measure, Lebesgue integral. Functions of several variables, directional derivative, partial derivative, derivative as a linear transformation, inverse and implicit function theorems. Metric spaces, compactness, connectedness. Normed linear Spaces. Spaces of continuous functions as examples.

Linear Algebra: Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformations. Algebra of matrices, rank and determinant of matrices, linear equations. Eigenvalues and eigenvectors, Cayley-Hamilton theorem. Matrix representation of linear transformations. Change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms. Inner product spaces, orthonormal basis. Quadratic forms, reduction and classification of quadratic forms

Complex Analysis: Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric and hyperbolic functions. Analytic functions, Cauchy-Riemann equations. Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem. Taylor series, Laurent series, calculus of residues. Conformal mappings, Mobius transformations.

Algebra: Permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, derangements. Fundamental theorem of arithmetic, divisibility in Z, congruences, Chinese Remainder Theorem, Euler's Ø- function, primitive roots. Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, Sylow theorems. Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain. Polynomial rings and irreducibility criteria. Fields, finite fields, field extensions, Galois Theory.

Topology: basis, dense sets, subspace and product topology, separation axioms, connectedness and compactness.

Ordinary Differential Equations (ODEs): Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs. General theory of homogenous and non-homogeneous linear ODEs, variation of parameters, Sturm-Liouville boundary value problem, Green's function. Partial Differential Equations (PDEs): Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first order PDEs. Classification of second order PDEs, General solution of higher order PDEs with constant coefficients, Method of separation of variables for Laplace, Heat and Wave equations.

Numerical Analysis: Numerical solutions of algebraic equations, Method of iteration and Newton-Raphson method, Rate of convergence, Solution of systems of linear algebraic equations using Gauss elimination and Gauss-Seidel methods, Finite differences, Lagrange, Hermite and spline interpolation, Numerical differentiation and integration, Numerical solutions of ODEs using Picard, Euler, modified Euler and Runge-Kutta methods. Calculus of Variations: Variation of a functional, Euler-Lagrange equation, Necessary and sufficient conditions for extrema. Variational methods for boundary value problems in ordinary and partial differential equations.

Linear Integral Equations: Linear integral equation of the first and second kind of Fredholm and Volterra type, Solutions with separable kernels. Characteristic numbers and eigenfunctions, resolvent kernel. Classical Mechanics: Generalized coordinates, Lagrange's equations, Hamilton's canonical equations, Hamilton's principle and principle of least action, Two-dimensional motion of rigid bodies, Euler's

dynamical equations for the motion of a rigid body about an axis, theory of small oscillations.

Descriptive statistics: exploratory data analysis Sample space, discrete probability, independent events, Bayes theorem. Random variables and distribution functions (univariate and multivariate); expectation and moments. Independent random variables, marginal and conditional distributions. Characteristic functions. Probability inequalities (Tchebyshef, Markov, Jensen). Modes of convergence, weak and strong laws of large numbers, Central Limit theorems (i.i.d. case). Markov chains with finite and countable state space, classification of states, limiting behavior of n-step transition probabilities, stationary distribution, Poisson and birth-and-death processes. Standard discrete and continuous univariate distributions. sampling distributions, standard errors and asymptotic distributions, distribution of order statistics and range. Methods of estimation, properties of estimators, confidence intervals.

Tests of hypotheses: most powerful and uniformly most powerful tests, likelihood ratio tests. Analysis of discrete data and chi-square test of goodness of fit. Large sample tests. Simple nonparametric tests for one and two sample problems, rank correlation and test for independence. Elementary Bayesian inference. Gauss-Markov models, estimability of parameters, best linear unbiased estimators, confidence intervals, tests for linear hypotheses. Analysis of variance and covariance. Fixed, random and mixed effects models. Simple and multiple linear regression. Elementary regression diagnostics. Logistic regression. Multivariate normal distribution, Wishart distribution and their properties. Distribution of quadratic forms. Inference for parameters, partial and multiple correlation coefficients and related tests. Data reduction techniques: Principal component analysis, Discriminant analysis, Cluster analysis, Canonical correlation.

Simple random sampling, stratified sampling and systematic sampling. Probability proportional to size sampling. Ratio and regression methods. Completely randomized designs, randomized block designs and Latin-square designs. Connectedness and orthogonality of block designs, BIBD. 2K factorial experiments: confounding and construction. Hazard function and failure rates, censoring and life testing, series and parallel systems.

Operations Research: Linear programming problem, simplex methods, duality. Elementary queuing and inventory models. Steady-state solutions of Markovian queuing models: M/M/1, M/M/1 with limited waiting space, M/M/C, M/M/C with limited waiting space, M/G/1.

Part B: Department Specific Subject: Department of Physics & Material Science

Section 1

I. Mathematical Methods of Physics

Dimensional analysis. Vector algebra and vector calculus. Linear algebra, matrices, Cayley-HamiltonTheorem. Eigenvalues and eigenvectors. Linear ordinary differential equations of first &second order, Special functions (Hermite, Bessel, Laguerre and Legendre functions). Fourier series, Fourier and Laplacetransforms. Elements of complex analysis, analytic functions; Taylor & Laurent series; poles, residuesand evaluation of integrals. Elementary probability theory, random variables, binomial, Poisson and normal distributions. Central limit theorem.

II. Classical Mechanics

Newton's laws. Dynamical systems, Phase space dynamics, stability analysis. Central force motions. Two body Collisions - scattering in laboratory and Centre of mass frames.Rigid body dynamics-moment of inertia tensor. Non-inertial frames and pseudoforces. Variational principle. Generalizedcoordinates. Lagrangian and Hainiltonian formalism and equations of motion. Conservation laws andcyclic coordinates. Periodic motion: small oscillations, normal modes. Special theory of relativity-Lorentz transformations, relative stick in ematics and mass—energyequivalence.

III. Electromagnetic Theory

Electrostatics: Gauss'slawand its applications, Laplace and Poisson equations, boundary value problems. Magnetostatics: Biot-Savart law, Ampere's theorem. Electromagnetic induction. Maxwell's equations in free space and linear isotropic media; boundary conditions on the fields at interfaces. Scalar and vector potentials, gauge invariance. Electromagnetic waves in free space. Dielectrics and conductors. Reflection and refraction, polarization, Fresnel's law, interference, coherence, and diffraction. Dynamics of charge particles in static and uniform electromagnetic fields.

IV. Quantum Mechanics

Wave-particle duality. Schrödinger equation (time-dependent and time-independent). Eigenvalue problems (particle in a box, harmonic oscillator, etc.). Tunneling through a barrier. Wave-function in coordinate and momentum representations. Commutators and Heisenberg uncertainty principle. Diracnotation for state vectors. Motion in a central potential: orbital angular momentum, angular momentum algebra, spin, addition of angular momenta; Hydrogen atom. Stern-Gerlach experiment. Time-independent perturbation theory and applications. Variational method. Time dependent perturbation theory and Fermi's golden rule, selection rules. Identical particles, Pauli exclusion principle, spin-statisticsconnection.

V. Thermo dynamic and Statistical Physics

Laws of the rmodynamics and their consequences. Thermodynamic potentials, Maxwell relations, chemical potential, phase equilibria. Phasespace, micro-and macro-states. Micro-canonical, canonical And grand-canonicalensembles and partition functions. Free energy and its connection with the rmodynamic quantities. Classical and quantum statistics. Ideal Bose and Fermi gases. Principle of detailed balance. Black body radiation and Planck'sdistributionlaw.

VI. Electronics and Experimental Methods

Semiconductor devices (diodes, junctions, transistors, field effect devices, homo- and hetero-junction devices), device structure, device characteristics, frequency dependence and applications. Opto-electronic devices (solar cells, photodetectors, LEDs). Operational amplifiers and their applications. Digital techniques and applications (registers, counters, comparators and similar circuits). A/D and D/A converters. Microprocessor and microcontroller basics. Data interpretation and analysis. Precision and accuracy. Error analysis, propagation of errors. Leastsquaresfitting,

Section 2

I. Mathematical Methods of Physics

Green's function. Partial differential equations (Laplace, wave and heat equations in two and three dimensions). Elements of computational techniques: root of functions, interpolation, extrapolation, integration by trapezoid and Simpson's rule, Solution of first order differential equation using Runge-Kuttamethod.Finite difference methods. Tensors. Introductory group theory: SU(2), O(3).

II. Classical Mechanics

Dynamical systems, Phase space dynamics, stability analysis. Poisson brackets and canonical transformations. Symmetry, invariance and Noether'stheorem. Hamilton-Jacob itheory.

III. Electromagnetic Theory

Dispersion relations in plasma. Lorentz invariance of Maxwell's equation. Transmission lines and wave guides. Radiation-from moving charges and dipoles and retarded potentials.

IV. QuantumMechanics

Spin-orbit coupling, fine structure. WKB approximation. Elementary theory of scattering: phase shifts, partial waves, Born approximation. Relativistic quantum mechanics: Klein-Gordonand Dirac equations. Semi-classical theory of radiation.

V. Thermodynamic and Statistical Physics

First- and second-order phase transitions. Diamagnetism, paramagnetism, and ferromagnetism. Isingmodel. Bose-Einstein condensation. Diffusion equation. Random walk and Brownian motion. Introduction to nonequilibrium processes.

VI. Electronics and Experimental Methods

Linear and nonlinear curve fitting, chi-square test. Transducers (temperature, pressure/vacuum, magneticfields, vibration, optical, and particle detectors). Measurement and control. Signal conditioning and recovery. Impedance matching, amplification (Op-ampbased, instrumentation amp, feedback), filtering and noise reduction, shielding and grounding. Fourier transforms, lock-in detector, box-car integrator, modulation techniques. High frequency devices (including generators and detector

VII. Atomic & MolecularPhysics

Quantum states of an electron in an atom. Electron spin. Spectrum of heliumand alkali atom. Relativisticcorrections for energy levels of hydrogen atom, hyperfme structure and isotopic shift, width of spectrumlines, LS & JJ couplings. Zeeman, Paschen-Bach & Stark effects. Electron spin resonance. Nuclear magnetic resonance, chemical shift. Frank-Condon principle. Born-Oppenheimer approximation. Electronic, rotational, vibrational and Raman spectra of diatomic molecules, selection rules. Lasers: spontaneous and stimulated emission, Einstein A& B coefficients. Optical pumping, population inversion, rate equation. Mode so fresonators and coherence length.

VIII. Condensed Matter Physics

Bravais lattices. Reciprocal lattice. Diffraction and the structure factor. Bonding of solids. Elastic properties, phonons, lattice specific heat. Free electron theory and electronic specific heat. Response and relaxation phenomena. Drude model of electrical and thermal conductivity. Hall effect and thermoelectric power. Electron motion in a periodic potential, band theory of solids: metals, insulators and semi conductors. Superconductivity: type-Iandtype-IIsuper conductors. Josephs on junctions. Super fluidity. Defects and dislocations. Ordered phases of matter: translational and orientational order, kinds of liquid crystal line order. Quasi crystals.

IX. Nuclearand Particle Physics

Basic nuclear properties: size, shape and charge distribution, spin and parity. Binding energy, semi-empirical mass formula, liquid drop model. Nature of the nuclear force, form of nucleon-nucleonpotential,

charge-independence and charge-symmetry of nuclear forces. Deuteronproblem. Evidence of shell structure, single-particle shell model, its validity and limitations. Rotational spectra. Elementary ideas of alpha, beta and gamma decays and their selection rules. Fission and fusion. Nuclear reactions, reaction mechanism, compound nuclei and directreactions.

Classification of fundamental forces. Elementary particles and their quantum numbers (charge, spin, parity, isospin, strangeness, etc.). Gellmann-Nishijima formula. Quark model, baryons and mesons.C, P, and T invariance. Application of symmetrical arguments to particle reactions. Parity non-conservation in weak interaction.Relativi stickinematics.

Part B: (Department Specific): Department of Chemistry & Environmental Science

Inorganic Chemistry

- Chemical periodicity
- Structure and bonding in homo- and heteronuclear molecules, including shapes of molecules (VSEPR Theory).
- Concepts of acids and bases, Hard-Soft acid base concept, Non-aqueous solvents.
- Main group elements and their compounds: Allotropy, synthesis, structure and bonding, industrial importance of the compounds.
- Transition elements and coordination compounds: structure, bonding theories, spectral and magnetic properties, reaction mechanisms.
- Inner transition elements: spectral and magnetic properties, redox chemistry, analytical applications.
- Organometallic compounds: synthesis, bonding and structure, and reactivity. Organometallics in homogeneous catalysis.
- Cages and metal clusters.
- Analytical chemistry- separation, spectroscopic, electro- and thermoanalytical methods.
- Bioinorganic chemistry: photosystems, porphyrins, metalloenzymes, oxygen transport, electron-transfer reactions; nitrogen fixation, metal complexes in medicine.
- Characterisation of inorganic compounds by IR, Raman, NMR, EPR, Mössbauer, UV-vis, NQR, MS, electron spectroscopy and microscopic techniques.
- Nuclear chemistry: nuclear reactions, fission and fusion, radio-analytical techniques and activation analysis.

Physical Chemistry:

- Basic principles of quantum mechanics: Postulates; operator algebra; exactly- solvable systems: particle-in-a-box, harmonic oscillator and the hydrogen atom, including shapes of atomic orbitals; orbital and spin angular momenta; tunneling.
- Approximate methods of quantum mechanics: Variational principle; perturbation theory up to second order in energy; applications.
- Atomic structure and spectroscopy; term symbols; many-electron systems and antisymmetry principle.
- Chemical bonding in diatomics; elementary concepts of MO and VB theories; Huckel theory for conjugated π-electron systems.
- Chemical applications of group theory; symmetry elements; point groups; character tables; selection rules. 6. Molecular spectroscopy: Rotational and vibrational spectra of diatomic molecules; electronic spectra; IR and Raman activities – selection rules; basic principles of magnetic resonance.
- Chemical thermodynamics: Laws, state and path functions and their applications; thermodynamic description of various types of processes; Maxwell's relations; spontaneity and equilibria; temperature and pressure dependence of thermodynamic quantities; Le Chatelier principle; elementary description of phase transitions; phase equilibria and phase rule; thermodynamics of ideal and non-ideal gases, and solutions.
- Statistical thermodynamics: Boltzmann distribution; kinetic theory of gases; partition functions and their relation to thermodynamic quantities – calculations for model systems.
- Electrochemistry: Nernst equation, redox systems, electrochemical cells; DebyeHuckel theory;

electrolytic conductance – Kohlrausch's law and its applications; ionic equilibria; conductometric and potentiometric titrations.

- Chemical kinetics: Empirical rate laws and temperature dependence; complex reactions; steady state approximation; determination of reaction mechanisms; collision and transition state theories of rate constants; unimolecular reactions; enzyme kinetics; salt effects; homogeneous catalysis; photochemical reactions.
- Colloids and surfaces: Stability and properties of colloids; isotherms and surface area; heterogeneous catalysis.
- Solid state: Crystal structures; Bragg's law and applications; band structure of solids.
- Polymer chemistry: Molar masses; kinetics of polymerization.
- Data analysis: Mean and standard deviation; absolute and relative errors; linear regression; covariance and correlation coefficient.

Organic Chemistry

- IUPAC nomenclature of organic molecules including regio- and stereoisomers.
- Principles of stereochemistry: Configurational and conformational isomerism in acyclic and cyclic compounds; stereogenicity, stereoselectivity, enantioselectivity, diastereoselectivity and asymmetric induction. 3. Aromaticity: Benzenoid and non-benzenoid compounds – generation and reactions.
- Organic reactive intermediates: Generation, stability and reactivity of carbocations, carbanions, free radicals, carbenes, benzynes and nitrenes.
- Organic reaction mechanisms involving addition, elimination and substitution reactions with electrophilic, nucleophilic or radical species. Determination of reaction pathways.
- Common named reactions and rearrangements – applications in organic synthesis.
- Organic transformations and reagents: Functional group interconversion including oxidations and reductions; common catalysts and reagents (organic, inorganic, organometallic and enzymatic). Chemo, regio and stereoselective transformations.
- Concepts in organic synthesis: Retrosynthesis, disconnection, synthons, linear and convergent synthesis, umpolung of reactivity and protecting groups.
- Asymmetric synthesis: Chiral auxiliaries, methods of asymmetric induction – substrate, reagent and catalyst-controlled reactions; determination of enantiomeric and diastereomeric excess; enantio-discrimination. Resolution – optical and kinetic.
- Pericyclic reactions – electrocyclisation, cycloaddition, sigmatropic rearrangements and other related concerted reactions. Principles and applications of photochemical reactions in organic chemistry.
- Synthesis and reactivity of common heterocyclic compounds containing one or two heteroatoms (O, N, S). 12. Chemistry of natural products: Carbohydrates, proteins and peptides, fatty acids, nucleic acids, terpenes, steroids and alkaloids. Biogenesis of terpenoids and alkaloids.
- Structure determination of organic compounds by IR, UV-Vis, 1H & 13C NMR and Mass spectroscopic techniques.

Interdisciplinary topics

- Chemistry in nanoscience and technology.
- Catalysis and green chemistry.
- Medicinal chemistry.
- Supramolecular chemistry.
- Environmental chemistry

Part B: Department Specific Subject: Management studies

Unit–I Management – Concept, Process, Theories and Approaches, Management Roles and Skills Functions – Planning, Organizing, Staffing, Coordinating and Controlling. Communication – Types, Process and Barriers. Decision Making – Concept, Process, Techniques and Tools Organisation Structure and Design – Types, Authority, Responsibility, Centralisation, Decentralisation and Span of Control Managerial Economics – Concept & Importance Demand analysis – Utility Analysis, Indifference Curve, Elasticity & Forecasting Market Structures – Market Classification & Price Determination National Income – Concept, Types and Measurement Inflation – Concept, Types and Measurement Business Ethics & CSR Ethical Issues & Dilemma Corporate Governance Value Based Organisation

Unit–II OrganisationalBehaviour – Significance & Theories Individual Behaviour – Personality, Perception, Values, Attitude, Learning and Motivation Group Behaviour – Team Building, Leadership, Group Dynamics Interpersonal Behaviour& Transactional Analysis Organizational Culture & Climate Work Force Diversity & Cross Culture OrganisationalBehaviour Emotions and Stress Management Organisational Justice and Whistle Blowing Human Resource Management – Concept, Perspectives, Influences and Recent Trends Human Resource Planning, Recruitment and Selection, Induction, Training and Development Job Analysis, Job Evaluation and Compensation Management

Unit-III Strategic Role of Human Resource Management Competency Mapping & Balanced Scoreboard Career Planning and Development Performance Management and Appraisal Organization Development, Change & OD Interventions Talent Management & Skill Development Employee Engagement & Work Life Balance Industrial Relations: Disputes & Grievance Management, Labour Welfare and Social Security Trade Union & Collective Bargaining International Human Resource Management – HR Challenge of International Business Green HRM

Unit–IV Accounting Principles and Standards, Preparation of Financial Statements Financial Statement Analysis – Ratio Analysis, Funds Flow and Cash Flow Analysis, DuPont Analysis Preparation of Cost Sheet, Marginal Costing, Cost Volume Profit Analysis Standard Costing & Variance Analysis Financial Management, Concept & Functions Capital Structure – Theories, Cost of Capital, Sources and Finance Budgeting and Budgetary Control, Types and Process, Zero base Budgeting Leverages – Operating, Financial and Combined Leverages, EBIT–EPS Analysis, Financial Breakeven Point & Indifference Level.

Unit–V Value & Returns – Time Preference for Money, Valuation of Bonds and Shares, Risk and Returns; Capital Budgeting – Nature of Investment, Evaluation, Comparison of Methods; Risk and Uncertainly Analysis Dividend – Theories and Determination Mergers and Acquisition – Corporate Restructuring, Value Creation, Merger Negotiations, Leveraged Buyouts, Takeover Portfolio Management – CAPM, APT Derivatives – Options, Option Payoffs, Option Pricing, Forward Contracts & Future Contracts Working Capital Management – Determinants, Cash, Inventory, Receivables and Payables Management, Factoring International Financial Management, Foreign exchange market

Unit-VI Strategic Management – Concept, Process, Decision & Types Strategic Analysis – External Analysis, PEST, Porter's Approach to industry analysis, Internal Analysis – Resource Based Approach, Value Chain Analysis Strategy Formulation – SWOT Analysis, Corporate Strategy – Growth, Stability, Retrenchment, Integration and Diversification, Business Portfolio Analysis - BCG, GE Business Model, Ansoff's Product Market Growth Matrix Strategy Implementation – Challenges of Change, Developing Programs Mckinsey 7s Framework Marketing – Concept, Orientation, Trends and Tasks, Customer Value and Satisfaction Market Segmentation, Positioning and Targeting Product and Pricing Decision – Product Mix, Product Life Cycle, New Product development, Pricing – Types and Strategies Place and promotion decision – Marketing channels and value networks, VMS, IMC, Advertising and Sales promotion

Unit-VII Consumer and Industrial Buying Behaviour: Theories and Models of Consumer Behaviour Brand Management – Role of Brands, Brand Equity, Equity Models, Developing a Branding Strategy; Brand

Name Decisions, Brand Extensions and Loyalty Logistics and Supply Chain Management, Drivers, Value creation, Supply Chain Design, Designing and Managing Sales Force, Personal Selling Service Marketing – Managing Service Quality and Brands, Marketing Strategies of Service Firms Customer Relationship Marketing – Relationship Building, Strategies, Values and Process Retail Marketing – Recent Trends in India, Types of Retail Outlets. Emerging Trends in Marketing – Concept of e-Marketing, Direct Marketing, Digital Marketing and Green Marketing International Marketing – Entry Mode Decisions, Planning Marketing Mix for International Markets

Unit–VIII Statistics for Management: Concept, Measures Of Central Tendency and Dispersion, Probability Distribution – Binominal, Poison, Normal and Exponential Data Collection & Questionnaire Design Sampling – Concept, Process and Techniques Hypothesis Testing – Procedure; T, Z, F, Chi-square tests Correlation and Regression Analysis Operations Management – Role and Scope Facility Location and Layout – Site Selection and Analysis, Layout – Design and Process Enterprise Resource Planning – ERP Modules, ERP implementation Scheduling; Loading, Sequencing and Monitoring Quality Management and Statistical Quality Control, Quality Circles, Total Quality Management – KAIZEN, Benchmarking, Six Sigma; ISO 9000 Series Standards Operation Research – Transportation, Queuing Decision Theory, PERT / CPM

Unit–IX International Business – Managing Business in Globalization Era; Theories of International Trade; Balance of payment Foreign Direct Investment – Benefits and Costs Multilateral regulation of Trade and Investment under WTO International Trade Procedures and Documentation; EXIM Policies Role of International Financial Institutions – IMF and World Bank Information Technology – Use of Computers in Management Applications; MIS, DSS Artificial Intelligence and Big Data Data Warehousing, Data Mining and Knowledge Management – Concepts Managing Technological Change

Unit–X Entrepreneurship Development – Concept, Types, Theories and Process, Developing Entrepreneurial Competencies Intrapreneurship – Concept and Process Women Entrepreneurship and Rural Entrepreneurship Innovations in Business – Types of Innovations, Creating and Identifying Opportunities, Screening of Business Ideas Business Plan and Feasibility Analysis – Concept and Process of Technical, Market and Financial Analysis Micro and Small Scale Industries in India; Role of Government in Promoting SSI Sickness in Small Industries – Reasons and Rehabilitation Institutional Finance to Small Industries – Financial Institutions, Commercial Banks, Cooperative Banks, Micro Finance.

Appendix-A Certificates Format

Appendix-A

CERTIFICATE – 1 (प्रमाणपत्र–1)

अनुसूचित जाति/जनजाति (UPSC/UPST/GDSC/GDST)

(अभ्यर्थी के जन्म जिले के जिला मजिस्ट्रेट/प्रथम श्रेणी मजिस्ट्रेट द्वारा प्रमाणित)

यह प्रमाणित किया जाता है कि श्री/कु0 ..... पुत्र/पुत्री श्री ..... निवासी गॉव/शहर .... तहसील ..... जिला ..... प्रदेश ..... का जन्म ..... जाति में हुआ था और यह जाति अनुसूचित जाति/जनजाति आदेश (संशोधन) एक्ट 1956 के अन्तर्गत भारत सरकार/उत्तरप्रदेश शासन .... सरकार द्वारा मान्य अनुसूचित जाति/जनजाति है।

अभ्यर्थी के हस्ताक्षर	हस्ताक्षर
दिनांक	नाम
स्थान	मुहर
	जिलाअधिकारी/अतिरिक्तजिलाअधिकारी/
	सिटीमजिस्ट्रेट/परगनामजिस्ट्रेट/तहसीलदार

Note: Proforma of certificate may be changed according to latest Govt. order.

CERTIFICATE – 2 (प्रमाणपत्र–2)

उत्तरप्रदेश के अन्य पिछड़े वर्ग के लिए जातिप्रमाणपत्र का प्रपत्र (UPBC/GDBC)

यह प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी ..... सुपुत्र/सुपुत्री श्री ....निवासी ग्राम ..... तहसील ..... नगर ..... जिला .... उत्तरप्रदेश राज्य की ..... पिछडी जाति के व्यक्ति हैं। यह जाति उत्तरप्रदेश लोकसेवा अनुसूचित जातियों । अनुसूचित जनजातियों तथा पिछडेवर्गों के लिए आरक्षण अधिनियम, 1994 की अनुसूची–1 के अन्तर्गत मान्यता प्राप्त है।

यह भी प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी ..... उक्त अधिनियम 1994 की अनुसूची–2 (अधिसूचना संख्या –22/16/92–का 02/1995 टी0 सी0 दिनांक 8 दिसम्बर, 1995 द्वारा यथासंशोधित) से आच्छादित नही है।

श्री/श्रीमती/कुमारी ..... तथा अथवा उनका परिवार उत्तरप्रदेश के ग्राम ..... श्री/श्रीमती/कुमारी ..... नगर ..... जिला ..... में सामान्यतया रहता है।

अभ्यर्थी के हस्ताक्षर

दिनांक

हस्ताक्षर

नाम

स्थान

मुहर

जिला अधिकारी/अतिरिक्त जिला अधिकारी/

सिटी मजिस्ट्रेट/परगना मजिस्ट्रेट/तहसीलदार

नोट–अभ्यर्थी ध्यान दें कि उ0प्र0 के अन्य पिछड़ेवर्ग के लिए जातिप्रमाण **मार्च 31, 2023** के पश्चात का बना हुआ होना आवश्यक है क्योंकि क्रीमीलेयर के अन्तर्गत आने वाले अभ्यर्थियों को आरक्षण का लाभ अनुमन्य नही है।

CERTIFICATE – 3 (प्रमाण पत्र –3)

उत्तरप्रदेश सामान्य निवासी के पुत्र/पुत्री (UPGD/GDSC/GDST/GDBC)

(उस जिले के अधिकारी द्वारा प्रमाणित जिस जिले के माता/पिता निवासी है)

यह प्रमाणित किया जाता है कि श्री/श्रीमती (अभ्यर्थी के पिता/माता का नाम) .....पिता/माता श्री/कु0 (अभ्यर्थी का नाम)..... उत्तरप्रदेश के गाँव/शहर ..... तहसील .....जिला ..... के सामान्य निवासी हैं तथा श्री/कु0 (अभ्यर्थी का नाम) ....अपने पिता/माता पर पूर्णतया आश्रित हैं।उक्त पते पर श्री/कु0 (अभ्यर्थी का नाम) ....के माता/पिता सामान्यतः निवास करते हैं।

दिनांक

स्थान

हस्ताक्षर जिलामजिस्ट्रेट

पूरा नाम

पदनाम

मुहर

(जिला मजिस्ट्रेट की सील)

'जिला मजिस्ट्रेट अथवा जिलामजिस्ट्रेट द्वारा अधिकृत अपर जिला मजिस्ट्रेट/सबडिवीजन मजिस्ट्रेट द्वारा प्रमाणपत्र ही मान्य होंगे जो शा0आ0 सं0–157/तीन –2003–77(प्र)/83 दिनांक 18 फरवरी, 2003 के अधीन जारी किया जायेगा।

नोट–प्रमाणपत्र–3 अभ्यर्थी के माता/पिता का बना होना चाहिए क्योंकि अभ्यर्थी जिन्होंने अर्हकारी परीक्षा उत्तरप्रदेश के बाहर स्थित किसी विद्यालय से उत्तीर्ण की है परन्तु उनके माता/पिता उत्तरप्रदेश के सामान्य निवासी हैं परीक्षा में बैठने के पात्र हैं।

CERTIFICATE – 4 (प्रमाणपत्र–4) (Sub-Category UPFF)

उत्तरप्रदेश लोक सेवा (शारीरिक रूप से विकलांग, स्वतंत्रता संग्राम सेनानी के आश्रितों और भूतपूव ैसैनिकों के लिए आरक्षण) अधिनियम, 1993 के अनुसार स्वतन्त्रता संग्राम सेनानी के आश्रित के प्रमाणपत्र का प्रपत्र

प्रमाणित किया जाता हैकि श्री/श्रीमती (स्वतंत्राता संग्राम सेनानी का नाम) ..... निवासी ग्राम ....तहसील ..... नगर ..... जिला ..... उत्तरप्रदेश लोक सेवा (शारीरिक रूप से विकलांग, स्वतंत्रता संग्राम सेनानी के आश्रितों और भूतपूर्व सैनिकों के लिए आरक्षण) अधिनियम 1993 के अनुसार स्वतन्त्रता संग्राम सेनानी हैं और श्री/श्रीमती/कु0 (आश्रित अभ्यर्थी का नाम) .... पुत्र/पुत्री/पौत्र/अविवाहित पौत्री उपरांकित अधिनियम, 1993 के ही प्रावधानों के अनुसार उक्त श्री/श्रीमती (स्वतन्त्रता संग्राम सेनानी) ..... के आश्रित हैं।

दिनांक

स्थान

हस्ताक्षर

पूरानाम एवं पदनाम

मुहर (जिला मजिस्ट्रेट की सील)

Note: Proforma of certificate may be changed according to latest Govt. order.

CERTIFICATE – 5 (प्रमाणपत्र–5)
(Sub-Category UPHC)

शारीरिकविकलांग के अधिमान के लिए प्रमाणपत्र (मुख्य चिकित्साअधिकारी द्वारा प्रमाणित)

1. यह प्रमाणित किया जाता है कि श्री/कु0 (अभ्यर्थी) .....पुत्र/पुत्री श्री (पिता का नाम) ....नीच`लिखे कारणों से शारीरिक रूप से विकलांग हैं।

   (केवल मुख्य चिकित्सा अधिकारी ही कारण लिखें).....

2. अभ्यर्थी की उपरोक्त विकलांगता को निम्नप्रकार की विकलांगता की श्रेणी में रखा जा सकता है।

   (कृपया✓ का निशान लगायें)

Type - I: Minimum 40% permanent Visual impairment	
Type-II: Minimum 40% permanent Locomotors disability	
Type-III: Minimum 40% permanent Speech Hearing impairment	

3. यह भी प्रमाणित किया जाता है कि उपरोक्त विकलांग स्थिति अभ्यर्थी के इन्जीनियरिंग शिक्षा प्राप्त करने में बाधक नहीं होगी।

अभ्यर्थी के हस्ताक्षर

नाम
दिनांक

चिकित्साधिकारी के हस्ताक्षर

नाम
मुहर

CERTIFICATE – 6 (प्रमाणपत्र–6)

CHARACTER CERTIFICATE FROM THE HEAD OF

THE INSTITUTION LAST ATTENDED

This is to certify that Sri/Km. _____

has been a bonafide student of _____

from _____ to _____and

has passed/appeared at the _____

examination in the year _____

Proctorial reports:

1. Has he/she involved himself/herself if any act of indiscipline? Yes/No
2. Has he/she been warned, Fined or punished for any act of indiscipline? Yes/No
3. Has he/she been restricted or expelled from Hostel of College for any reason? Yes/ No
4. Has he/she been involved in any act of indiscipline outside the College campus like group clashes or fraction fights etc. Yes/ No
5. Has he/she been addicted to drugs or intoxicants? Yes/ No

General remarks (Please state your assessment of the student)

Date:

Signature_____

Name_____

Designation _____

CERTIFICATE – 7 (प्रमाणपत्र–7)

FORMAT FOR MEDICAL CERTIFICATE

(To be obtained from a Chief Medical Officer or Medical Officer of MMMUT, Gorakhpur)

This certificate has to be submitted at the time of admission in the University

<table>
<tr><td colspan="4">Name of Candidate: Age: Sex:

Roll No.: Category: Subcategory and Weighatge:

Rank Position: Father's Name:

(To be filled in by the Candidate)</td></tr>
<tr><td colspan="3">L.T. M.I.

Height Weight Chest Abdomen</td><td>VISION

Colour Vision:

Without glass:

With glass:</td></tr>
<tr><td colspan="4">History Operation Koch’sColic’s B.P.

Seizures Asthma Piles Diabetes</td></tr>
<tr><td rowspan="4">EXAMINATION</td><td>Pulse Tonsil DNS Hernia

Pallor L.Nodes CSOM Hydrocele</td><td colspan="2"></td></tr>
<tr><td>Cardiovascular CNS</td><td colspan="2"></td></tr>
<tr><td>Respiratory GIT</td><td colspan="2"></td></tr>
<tr><td>Genitourinary Others</td><td colspan="2"></td></tr>
</table>

Is the candidate physically handicapped/Disabled:	(Please tick) Yes/No
If yes, type of handicap/disability: (Please trick ✓ the type of handicap/disability)	☐ Type - I: Minimum 40% permanent Visual impairment ☐ Type-II: Minimum 40% permanent Locomoter disability ☐ Type-III: Minimum 40% permanent speech and Hearing impairment
Any other finding:	
Certified that the candidate is physically fit/unfit/temporally disqualified to pursue engineering studies	

Signature of Candidate Signature of the issuing Medical Officer (with Official stamp)

CERTIFICATE – 8 (प्रमाणपत्र–8)

UNDERTAKING BY CANDIDATE FOR MEDICAL FITNESS

I certify that I have no such physical handicap/disability which would hinder the pursuit of studies in the Programs in which I am seeking admission. If at any stage it is found that I have a physical handicap/ disability which would hinder the pursuit of studies in the Programs in which I am seeking admission then my admission will be liable to be cancelled. I will produce medical fitness certificate from a C.M.O./C.M.S. at the time of my joining the University.

Dated: Counter Signed by Father/Guardian Signature of the Candidate

CERTIFICATE – 9 (प्रमाणपत्र–9)

(Income Certificate)

क्षेत्रीय भूलेख निरीक्षक तथा लेखपाल की जांचरिपोर्ट के आधारपर प्रमाणित किया जाता है कि .....
.....;आवेदक के अभिभावक / माता / पिता का नामद्धसुपुत्र .....
.....निवासी / ग्राम.....परगना

.....तहसील.....नगर .....जिला.....
.....राज्य.....के स्वयं की मासिक आय रूपया.....
.....तथा वार्षिक आय रूपया .....है।

लेखपाल की रिपोर्ट के अनुसार आय का स्रोत.....है।

स्थानः

दिनॉकः तहसीलदार

मुहर

नोट–अभ्यर्थी ध्यान दे कि उ0प्र0 के आर्थिक रूप से कमजोर अभ्यर्थियों के लिए प्रमाणपत्र मार्च 31, 2023 के पश्चात का बना हुआ होना आवश्यक है।

CERTIFICATE – 10 (प्रमाणपत्र–10)
This certificate should be issued on Organization letter head

Sponsorship Certificate for _____

Programme

This is to certify that Mr._____is a regular employee of__

_____department of this Organization.

Mr._____ has _____Year(s) and _____months of experience at this organization and _____Year(s) and _____months of total experience .

If selected in the programme, Mr._____will be relieved for the full duration of the programme with sponsorship.

This Institute/organisation is Government/Semi-Government Institutions/Government/Semi-Government Organization and Institute/organisation has No Objection in Mr./Ms._____ pursuing full time Ph.D. under sponsorship category at MMMUT Gorakhpur.

Place Name and signature of the employer

Date: E-mail ID._____

CERTIFICATE – 11 (प्रमाणपत्र–11)

मदन मोहन मालवीय प्रौद्योगिकी विश्वविद्यालय
Madan Mohan Malaviya University of Technology
Gorakhpur – 273010, UP, INDIA

UNDERTAKING

(A duly filled and signed copy of this undertaking must be uploaded along with other documents)

The head of Department- …….(Name of Department)
Madan Mohan Malaviya University of Technology
Gorakhpur – 273010, UP, INDIA

I,_____<name>_____son / daughter of_____, resident of_____, having Ph.D. Application No._____have been selected to the Ph.D. programme for the session 20__ -__ of MMMUT Gorakhpur.

I undertake that I have read and understood the advertised criteria and ascertain that I fully meet all the eligibility criteria.

I undertake that the documents such as, mark sheets / grade sheets, caste/category certificate, photo id, etc. uploaded by me in support of my eligibility to this programme are correct to the best of my knowledge.

I undertake to produce all the documents uploaded by me in support of my eligibility in original at the time of physical verification of the documents whenever asked to do so by the Institute (MMMUT Gorakhpur). In case, my uploaded documents cannot be verified from the originals OR if I fail to produce/submit any document(s) which is required to establish my eligibility during physical verification, or during the course of study, at any stage it is found that any of the documents (related to my eligibility) is not correct, then my admission to this programme will be cancelled by the Institute for which I shall bear the sole responsibility. I hereby undertake to be abided by the decision of the Institute (MMMUT Gorakhpur). I declare that for such eventuality, MMMUT Gorakhpur will NOT be held responsible. Further, the Institute will be free to initiate legal action as per law.

(Signature of the parents/guardian)		(Signature of the candidate)	
Name:	_____	Name:	_____
Date:	_____	Date:	_____
Contact No. :	_____	Contact No. :	_____

CERTIFICATE – 13A

उत्तर प्रदेश सरकार

कार्यालय का नाम.....

आर्थिक रूप से कमजोर वर्ग के सदस्य द्वारा प्रस्तुत किया जाने वाला आय एवं परिसम्पति प्रमाण-पत्र

प्रमाण-पत्र संख्या-..... दिनांक-.....

वित्तीय वर्ष ..... के लिए मान्य

प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी .....

पुत्र/पति/पुत्री ..... ग्राम/कस्बा.....

पोस्ट ऑफिस ..... थाना .....

तहसील ..... जिला ..... राज्य .....

पिन कोड..... के स्थायी निवासी है, जिनका फोटोग्राफ नीचे अभिप्रमाणित है, आर्थिक रूप से कमजोर वर्ग के सदस्य हैं, क्योंकि वित्तीय वर्ष ..... में इनके परिवार की कुल वार्षिक आय 8 लाख (आठ लाख रूपये मात्र) से कम है। इनके परिवार के स्वामित्व में निम्नलिखित में से कोई भी परिसम्पति नहीं है:-

I. 5 (पाँच) एकड़ कृषि योग्य भूमि अथवा इससे ऊपर ।
II. एक हजार वर्ग फीट अथवा इससे अधिक क्षेत्रफल का फ्लैट।
III. अधिसूचित नगरपालिका के अंतर्गत 100 वर्ग गज अथवा इससे अधिक का आवासीय भूखण्ड।
IV. अधिसूचित नगरपालिका से इतर 200 वर्ग गज अथवा इससे अधिक का आवासीय भूखण्ड।

2. श्री/श्रीमती/कुमारी ..... जाति ..... के सदस्य हैं, जो अनुसूचित जाति, अनुसूचित जनजाति तथा अन्य पिछड़े वर्गों के रूप में अधिसूचित नहीं है।

आवेदक का पासपोर्ट साईज का अभिप्रमाणित फाटोग्राफ

हस्ताक्षर ..... (कार्यालय का मुहर सहित)

पूरा नाम .....

पदनाम .....

जिलाधिकारी/अतिरिक्त जिलाधिकारी/सिटी मजिस्ट्रेट/परगना मजिस्ट्रेट/तहसीलदार।

http://shasanadesh.up.nic.in

<u>कार्यालय-ज्ञाप संख्या-3/2019/4/1/2002/का-2/19टी.सी.-।।, दिनांक 14 मार्च, 2019 का संलग्नक</u>

CERTIFICATE-13B

आर्थिक रूप से कमजोर वर्ग के लाभार्थ स्वंय घोषणा पत्र

<u>स्वंय घोषणा पत्र</u>

मैं ..... पुत्र/पुत्री/पत्नी ..... ग्राम/कस्बा ..... पोस्ट ऑफिस ..... थाना ..... ब्लाक ..... तहसील ..... जिला ..... राज्य ..... ने आर्थिक रूप से कमजोर वर्ग के प्रमाण पत्र हेतु आवेदन दिया है, एतद् द्वारा घोषणा करता/करती हूँ :-

1. मैं ..... जाति से सम्बन्ध रखता/रखती हूँ, जो उत्तर प्रदेश हेतु अधिसूचित अनुसूचित जाति, अनुसूचित जनजाति एवं अन्य पिछड़ा वर्ग की सूची में सूचीबद्ध नहीं है।

2. मेरे परिवार की कुल श्रोतों (वेतन, कृषि, व्यवसाय, पेशा इत्यादि) से कुल वार्षिक आय रू ..... (शब्दों में) है।

3. मेरे परिवार के पास उल्लिखित आय के सिवाय अथवा इसके अतिरिक्त अन्यत्र कोई परिसम्पत्ति नहीं है।

अथवा

कई स्थानों पर स्थित परिसम्पतियों को जोड़ने के पश्चात भी मैं (नाम) ..... आर्थिक रूप से कमजोर वर्ग के दायरे में आता/आती हूँ।

4. मैं घोषणा करता/करती हूँ कि मेरे परिवार की सभी परिसम्पत्तियों को जोड़ने के पश्चात् निम्नलिखित में से किसी भी सीमा से अधिक नहीं है-

I. 5 (पाँच) एकड़ कृषि योग्य भूमि अथवा इससे ऊपर ।

II. एक हजार वर्ग फीट अथवा इससे अधिक क्षेत्रफल का फ्लैट।

III. अधिसूचित नगरपालिका के अंतर्गत 100 वर्ग गज अथवा इससे अधिक का आवासीय भूखण्ड।

IV. अधिसूचित नगरपालिका से इतर 200 वर्ग गज अथवा इससे अधिक का आवासीय भूखण्ड।

मैं प्रमाणित करता/करती हूँ कि मेरे द्वारा उपरोक्त जानकारी मेरे ज्ञान और विश्वास के अनुसार सत्य है और मैं आर्थिक रूप से कमजोर वर्ग के लिए आरक्षण सुविधा प्राप्त करने हेतु पात्रता धारण करता/करती हूँ। यदि मेरे द्वारा दी गई जानकारी असत्य/गलत पायी जाती है तो मैं पूर्ण रूप में जानता हूँ/ जानती हूँ कि इस आवेदन पत्र के आधार पर दिये गये प्रमाण पत्र के द्वारा शैक्षणिक संस्थान में लिया गया प्रवेश/लोक सेवाओं एवं पदों में प्राप्त की गई नियुक्ति निरस्त कर दी जायेगी/कर दिया जायेगा अथवा इस प्रमाण पत्र के आधार पर कोई अन्य सुविधा/लाभ प्राप्त किया गया है उससे भी वंचित किया जा सकेगा और इस सम्बन्ध में विधि एवं नियमों के अधीन मेरे विरूद्ध की जाने वाली कार्यवाही के लिए मैं उत्तरदायी रहूँगा/रहूँगी।

नोटः- जो लागू नहीं हो उसे काट दें।

आवेदक/आवेदिका का हस्ताक्षर तथा पूरा नाम।

स्थान :-

दिनांक :-