DELHI TECHNOLOGICAL UNIVERSITY

(Formerly Delhi College of Engineering)

ACCREDITED with 'A' Grade (CGPA 3.22 out of 4.0) by NAAC | **ISO 9001:2015 Certified**

ADMISSION BROCHURE

M. Sc. PROGRAMMES

2020-21

Tentative Admission Schedule with Important Dates

(For Final Schedule & Important Dates, visit DTU website : www.dtu.ac.in)

S. No.	Activity/ Event	Date
1.	Advertisement in newspapers.	24.06.2020 (Wednesday)
2.	Opening of website for Online Registration	24.06.2020 (Wednesday) 10:00 AM
3.	Last date for Online Registration	20.07.2020 (Monday) 12:00 midnight
4.	Display of eligible candidates list for written examination	24.07.2020 (Friday) 05:00 PM
5	Issue of ONLINE Admit Card	05.08.2020 (Wednesday)
6	Written examination for M.Sc.	11.08.2020 (Tuesday)*
7	List of shortlisted candidates on the basis of written examination conducted by DTU for 1st round admission on DTU website.	13.08.2020 (Thursday) 08:00 PM
8	1st round admissions at DTU for all branches (Selected candidates are required to report along with original documents and online fee deposit receipt as detailed in Section – 6)	19.08.2020 (Wednesday) 10:00 AM
9	Submission of Freezing Forms in the department	20.08.2020 (Thursday) 5:00 PM
10	Display of vacant seats for 2nd round on DTU admissions website	25.08.2020 (Tuesday) 5:00 PM
11	2nd round admissions at DTU (Selected candidates are required to report along with original documents and online fee deposit receipt as detailed in Section- 6)	03.09.2020 (Thursday) 10:00 AM
12	Display of vacant seats for spot round on DTU admissions website	10.09.2020(Thursday) 06:00 PM
13	Spot round of admissions at DTU (Selected candidates are required to report along with original documents and online fee deposit receipt as detailed in Section -6)	14.09.2020 (Monday) 10:00 A.M

*Note: Schedule of Entrance Examination for each course shall be notified on website.

Candidates are advised to read the brochure carefully and to visit the website **www.dtu.ac.in** regularly for updates and other details about the entire online admission process.

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2020-21

दिल्ली प्रौद्योगिकी विश्वविद्यालय
DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)

D T U
Delhi Technological
UNIVERSITY

Prof. Yogesh Singh
Vice-Chancellor

E-MAIL : vcdtu@dce.edu

Message

It is my immense pleasure to announce that Delhi Technological University is commencing admissions to its various graduate and postgraduate courses for the academic year 2020-21 in May 2020.
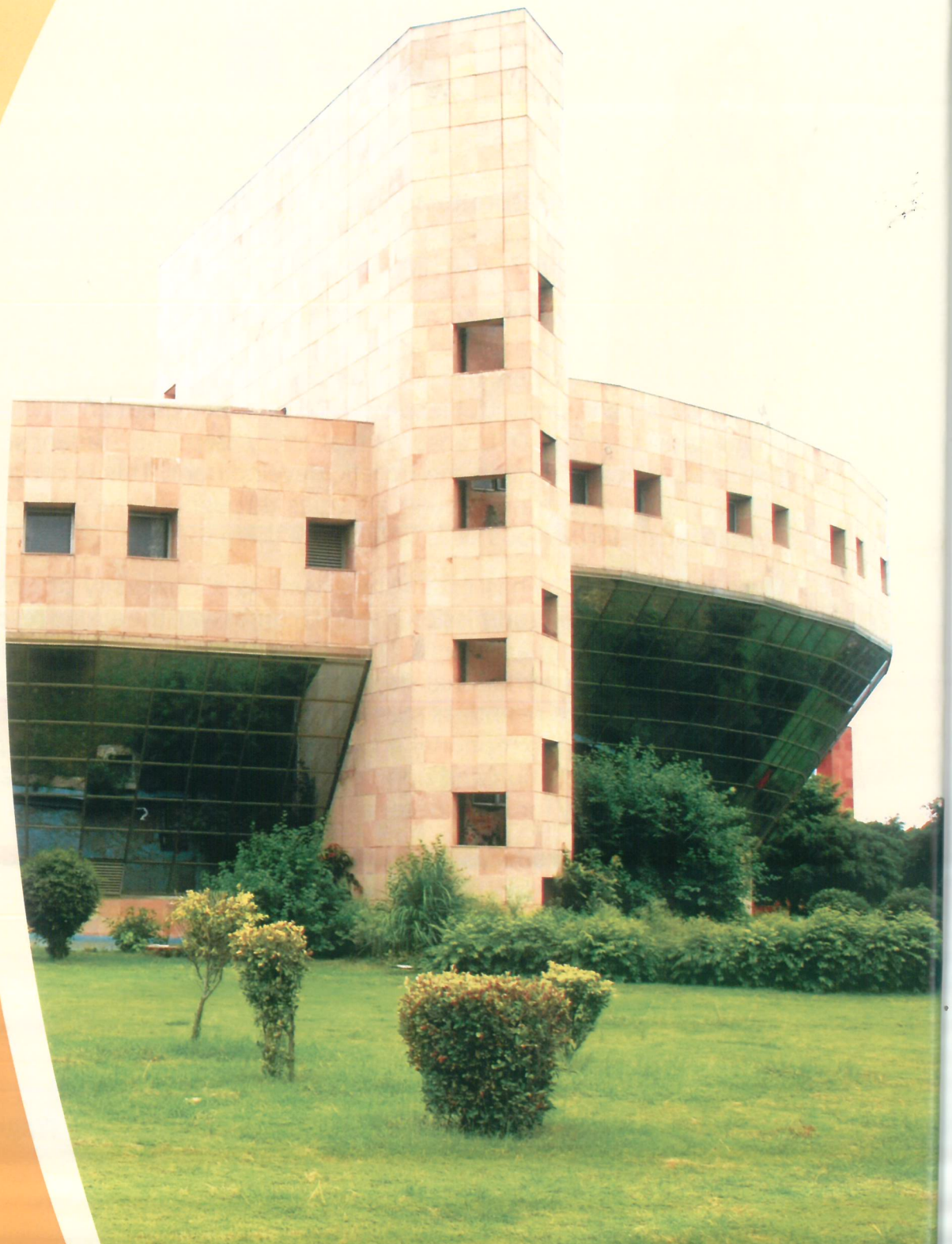
Delhi Technological University has a long legacy of honing talent and a home to students who moved on to achieve greatness. Students admitted to DTU through their dedication, discipline and steadfastness can go on to become professionals and impactful leaders. DTU provides them an environment to shape their talent as DTU ensures that every step of a student's journey is designed keeping in mind the holistic development. This is coupled with a diverse range of extra-curricular activities throughout the year, which help students develop various skills to facilitate them throughout their lives.

Over the years, DTU has established itself as a University of unshakeable repute. Hence, getting admission into DTU comes with the added responsibility of keeping the standards high. DTU Alumni have scaled great heights on the national and international stages, and continue to make us proud. The conjoined efforts of relentless students, faculty, administration and the staff have preserved an exceptional environment in DTU that allows persistent exchange of information and upholds the unmatched excellence associated with this University for eight decades.

Every year, DTU produces competent engineers, fully equipped with the knowledge and confidence to go forth and achieve greatness. We believe the incoming batch is yet another example of the same, and will one day change the world for the better.

(Yogesh Singh)

ABOUT DELHI TECHNOLOGICAL UNIVERSITY

ABOUT
DELHI TECHNOLOGICAL UNIVERSITY

Delhi Technological University (Formerly known as Delhi College of Engineering) is one of the most well-known engineering institutions of India, with over 79 years of glorious tradition behind it. A non-affiliating, teaching and research University, DTU is poised to create an environment of synergetic partnership between academia and industry. It aims to cause a major departure from the conventional system of education and research and aspires to imbibe a culture of scientific research in its technology disciplines and technology temper in its scientific research and education by providing a seamless environment for integration of science and engineering. The University also endeavours to provide the thrill of a corporate R&D environment with a planned focus on industrially relevant projects and technology incubation. DTU has consistently been ranked among the top engineering institutions of the country in reputed surveys.

Currently the University offers 17 Full time UG programmes, 20 Full time and Part Time M. Tech. programmes, 05 Full time MBA programmes and 01 Executive MBA Weekend programme, 03 M.Sc. programmes and Ph.D. in various disciplines. Further, teachers from various engineering colleges also join University for the doctoral programmes under Quality Improvement Programme (QIP). The University on an average admits 2500 candidates for the Undergraduate Programmes and about 900 candidates for different Postgraduate programmes and Doctoral programmes every year.

The University is located in about 164 acres of natural flora and fauna, DTU is one of the greenest residential campuses in the country. It has added the dimension of research and caused innovations in plenty, which has received high national and international acclaim. The University has the desired autonomy to excel and shape itself as a world class Technological University.

More information about DTU can be accessed at **www.dtu.ac.in.**

VISION

To be a world class university through education, innovation and research for the service of humanity

MISSION

To establish centres of excellence in emerging areas of science, engineering, technology, management and allied areas.

To foster an ecosystem for incubation, product development, transfer of technology and entrepreneurship.

To create environment of collaboration, experimentation, imagination and creativity.

To develop human potential with analytical abilities, ethics and integrity.

To provide environment friendly, reasonable and sustainable solutions for local & global needs.

1. M. Sc. PROGRAMMES

The M.Sc. Two Years Degree Programme offers quality education in the disciplines of Mathematics, Physics and Bio Technology. The course is designed to provide a Basket of 'Elective' courses as an integral component of curriculum, for catering to the varied interests of the students, so that students can develop 'specialization' in the areas of their academic and professional interest. The interdisciplinary content of the curricula which is based on Choice Based Credit System (CBCS) guidelines issued by University Grants Commission (UGC) equips the students with the ability to utilize scientific knowledge foundation for practical and Industrial applications. The medium of instruction is English for the programme. The educational qualifications and eligibility conditions for admission is given in the Table-1.

Table-1

S. No.	Name of Department	Programme Name	Number of Sanctioned Seats	Essential qualifications
1.	Applied Mathematics	M.Sc. Mathematics (MSCMAT)	40	BA/B.Sc. (Gen. OR Hons.) with 55% or equivalent CGPA provided by the concerned Institute/ University with Mathematics as one of the main subject.
2.	Applied Physics	M.Sc. Physics (MSCPHY)	40	B.Sc.(Gen./Hons.) with 55% or equivalent CGPA provided by the concerned Institute/ University with Physics as one of the main subject.
3.	Bio Technology	M.Sc. Bio Technology (MSCBT)	40	B.Sc.(Gen/Hons.) with 55% or equivalent CGPA provided by the concerned Institute/ University with Biology as one of the main subject.

In case CGPA or conversion formula has not been provided by the concerned Institute/ University then equivalent CGPA will be computed as per the following

Percentage of Marks= 10 X CGPA

Relaxation in minimum percentage requirement will be granted to candidates belonging to SC/ST/PwD/OBC categories as given in **Table 2.** The aggregate marks awarded for the qualifying degree will be `considered for eligibility. Admission to the M.Sc. programmes as given in Table-1, will be made on the basis of merit in the written test to be conducted by the DTU.

a. Final year students who will be completing all the requirements of their qualifying examination including back paper(s)/ supplementary(ies) before the date of admission may

also apply. Such candidates will be required to submit a certificate as per the proforma given in **Annexure-1** along with the application form. Such candidates may be admitted provisionally but they will be required to produce the proof of having passed the qualifying degree with the required percentage of marks or CGPA latest by **October 31, 2020**, failing which their admission shall be cancelled.

b. Detailed seat matrix indicating seats in various departments under different categories is given below:

Seat Matrix for M. Sc. Programmes for the Session 2020 – 21

Category	Department/ Branch	AM Mathematics	AP Physics	BT Biotechnology	Total
General	Open	15	16	15	
	PwD	01	01	01	
Total Gen Seats		**16**	**17**	**16**	**49**
SC	SC	06	06	05	
	SC-PwD	--	--	01	
Total SC Seats		**06**	**06**	**06**	**18**
ST	ST	03	03	03	
	ST-PwD	--	--	--	
Total ST Seats		**03**	**03**	**03**	**09**
OBC	OBC	11	09	11	
	OBC-PwD	--	01	--	
Total OBC Seats		**11**	**10**	**11**	**32**
EWS	EWS	03	04	04	
	EWS-PwD	01	--	--	
Total EWS Seats		04	04	04	12
Total Seats		**40**	**40**	**40**	**120**

2. Reservation of Seats for Different Categories and Relaxation in Essential Qualifications

Admissions to the M.Sc. programmes will be made on All India basis. The university follows the reservations rules of Govt. of NCT of Delhi. Table 2 given below indicates the percentage of reservations for various categories and relaxation in minimum eligibility conditions as applicable for the academic session 2020 - 21

Table-2

S. No.	Category	Seats reserved	Relaxation in Essential qualification
1	Scheduled Castes (SC)	15%	5%
2	Scheduled Tribes (ST)	7.5 %	5%
3	Other Backward Classes (OBC)	27%	NIL
4	Persons with Disability (PwD)	5% (Horizontal)	5%
5.	EWS	10%	--

The reservations for persons with disabilities will be implemented department wise. Candidates seeking admission must fulfil the eligibility conditions as detailed earlier. The 5% reservation horizontally in seat matrix for persons with disability may be allocated as follows. The format of disability certificate is available at **Annexure-3**

Against the seats identified for each disability, of which, one percent each shall be reserved for persons with benchmark disabilities under clauses (a), (b), and (c) and one percent, under clauses (d) and (e).

a. Blindness and low vision;

b. Deaf and hard of hearing;

c. Locomotors disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy;

d. Austin, intellectual disability, specific learning disability and mental illness;

e. Multiple disabilities from amongst persons under clauses (a) to (d) including deaf-blindness.

f. Physically handicapped applicants are permitted 5% marks of equivalent CGPA relaxation in eligibility requirement in line with the policies of Govt. of NCT of Delhi. They will not be allowed any other relaxation beyond this limit even if they belong to SC/ST category.

Formula for conversion of seats

If the seats remain vacant in some specific categories, with no waiting list available in those categories, the seats shall be converted as per the details given below on the day of spot round of counselling.

Existing Seats	Seats converted into
PwD seat of General/ OBC/SC/ST Categories	General/OBC/ SC/ST Category (i.e. in respective categories)
OBC Seat	General Category Seat
SC Seat	ST Seat
ST Seat	SC Seat

3. Application Process

For admission to M.Sc. programmes 2020, all candidates need to register and fill the application ONLINE only by accessing www.dtu.ac.in from June 24, 2020 to July 20, 2020. The application process is completed only when a print out of the filled ONLINE application form is taken after paying online registration fee. The candidate must bring a duly signed copy of the same along with two good quality photo **(same as uploaded on online application form)** affixed in the appropriate place on the form on the day of counselling.

Candidates, whose final year result is awaited, may also fill the online application form. Once the candidate has registered and paid the registration fees, he/she would be sent a separate link to upload their graduation marks by August 30, 2020.

Candidates are requested to ensure that they must fulfill all such requirements before filling and applying for such programmes as their choices. Incomplete application due to any reason is liable for rejection by the University. In this regard, no communication will be entertained.

3.1 Application Fee

The registration fee of Rs. 1000/- for Gen/OBC/EWS and Rs. 500/- for SC/ST/PwD, is to be paid online through credit/debit card /net banking at the time of registration and choice filling. The registration shall not be complete without the payment of registration fee which is non-refundable and would not be adjusted towards any other fee. A convenience charge (online transaction) will be extra as per banking gateway on every online registration fee payment.

If a candidate wishes to apply for admission in a programme offered by different departments then he/she will have to register separately in that department by paying separate online registration fee and there will be separate entrance test for each M.Sc. programme.

3.2 Rules for Seat Allotment

Separate merit list for each M.Sc. Programme will be prepared on the basis of DTU entrance test score. The entrance test will be of 60 minutes duration comprising of 40 multiple choice questions. The cut off for the same will be decided by the University.

Note: In view of the ongoing COVID 19 pandemic in the country, the mode of conducting the Admission/ Entrance Test shall be one of the following depending upon situation at the time of test:

i.   OMR Based Pen-Paper type at DTU Campus.

ii. Computer Based Test at DTU Campus.

iii. AI & Manually proctored Online Examination.

iv. Any other mode as per the situation.

The exact mode of examination shall be posted on the University Website prior to the Admission Test.

To resolve and determine inter-se-merit of candidates having same score in DTU entrance test, following criterion will be used in the stated order of preference.

1. Date of Birth will be compared and elder candidate will be given preference;

2. In highly unlikely event of date of birth is same, then rank will be decided on the basis of marks/CGPA obtained in the qualifying degree.

3.3 First round of admission

a. The list of selected candidates will be displayed for first round of admissions along with first round admission schedule on the university website **www.dtu.ac.in** and department notice boards. In case some seats remain unfilled then second round of counselling may be conducted.

b. The selected candidates in every round of admission shall deposit the requisite fee online as per the given schedule on the university website and submit a copy of fee receipt back to the respective department. Admission shall not be valid without payment of fee and submitting the fee receipt to the department.

c. The candidates shall have to produce the relevant documents in original (as notified in Section

6) for verification at the time of admission. If a candidate fails to report for admission on the scheduled date OR he/she is not able to submit the required documents or fee, he/she shall forfeit his/her claim for admission and the seat shall be offered to the next eligible candidate in the order of merit. Further, the candidate will not be eligible for subsequent rounds.

d. A candidate can send his authorized representative with all the required documents and fee to report for admission in case he/she is unable to report for admission in person. **The authorized representative must come with the duly signed authorization letter.**

e. The candidates may freeze his/ her admission in a particular M.Sc. programme, by filling up a freezing form and submitting the same in the department concerned as per the schedule displayed on the admission website.

3.4 Second / subsequent rounds of admission (Subject to availability of seats)

a. A list of seats available for admission during second/spot round of admission will be displayed on the DTU admission website as per the schedule given. Candidates are advised to check the DTU website regularly.

b. The second/ subsequent rounds for all the programmes will be held at the same venue i.e. respective department. No separate communication will be sent in this regard.

c. No admission will be made directly to second or higher semester of any programme.

4. Fee Structure

The detailed fee structure for M.Sc. Programme is given below:

S. No.	Particulars	AY 2020-21 1st Year (Rs.)	AY 2021-22 2nd Year (Rs.)
1.	Tuition Fee	14000	15000
2.	Non Govt. Component		
2.1	Student Welfare Fee (Co-curricular activities, Training & placement, Extra Curricular Activities, Annual Gathering, Students welfare, Institutional Development, outsourcing, conference, seminar, workshop, innovative projects, skill development activities and, Misc. Expenditure on Unspecified Items)	8000	8000
2.2	Facilities & Services Charges (Research initiatives, training programmes, Awards, automation, facilities, entrepreneurship activities and any misc. expenditure on unspecified items)	1500	1500
2.3	Economically weaker section fund	4000	4000
2.4	Examination fee (Examination Infrastructure strengthening, expenditure on examination activities, confidential printing etc.	4000	4000
2.5	Premium amount for med claim of student (per-annum)	500	500
	GRAND TOTAL	**Rs.32,000**	**Rs.33,000**

The annual fee of the M.Sc. programme will have to be deposited online by the candidate at the time of admission on the university website. Candidates must note that the admission fee must be paid in single installment failing which the admission offer will be withdrawn immediately. Wait listed candidates (if offered admission during counselling) will be given one-day time to deposit the admission fee.

If the admission fee is not paid within the stipulated date and time, then the offer of admission given to them will be withdrawn automatically and the seat will be offered to the next eligible candidate.

5. Withdrawal / Refund Policy

The University follows the following policy for the remittance and refund of fee, if a student chooses to withdraw from programme of study in which he / she is enrolled:

S. No.	Point of time when application for withdrawal of admission received	Percentage of Refund of aggregate fee (Exclusive of Caution Money and Security Deposit)
1.	Application for withdrawal of admission received upto 21.09.2020.	100%
2.	Application for withdrawal of admission received upto 25.09.2020	80%
3.	Application for withdrawal of admission received upto 30.09.2020	50%
4.	Application for withdrawal of admission received after 30.09.2020	NIL

6. Documents Required

The candidates should report at the venue mentioned by the respective departments on the specified date and time for admission round in person (or through an authorized representative) along with the following original documents and one set of self-attested photocopies, two passport size photographs, printout of the registration form duly signed and annual fee receipt paid online on the university website.

a.   Date of Birth proof /10th certificate

b.   All mark sheets and certificate of qualifying examination (Graduation).

c.   SC/ST/OBC/Persons with disability Certificate(s) whichever applicable, on the basis of which reservation is claimed. OBC candidates must produce necessary financial document to support their category as per **Annexure-2**.

d.   EWS Income and Asset certificate issued by the Competent Authority (For those who have applied for M.Sc. admission under EWS category)

Syllabus for

Entrance Examination

for

M. Sc. ADMISSIONS

Session:
August 2020

Syllabus for M.Sc. (Mathematics) Entrance Examination

1. **Real Sequences and Series:** Sequence & sub-sequences of real numbers, convergent & divergent sequences, bounded and monotone sequences, convergence criteria for sequences of real numbers, Cauchy sequences, Bolzano-Weierstrass theorem. Series of real numbers, tests of convergence for series of positive terms: – comparison test, ratio test, root test; Leibniz test for convergence of alternating series, absolute convergence.

2. **Functions of Single Variable:** Limit, continuity, intermediate value property, differentiation, Rolle's Theorem, mean value theorem, L'Hospital rule, Taylor's theorem, maxima and minima.

3. **Functions of Multivariable:** Limit, continuity, partial derivatives, differentiability, maxima and minima.

4. **Integral Calculus:** Definite integrals and their properties, fundamental theorem of calculus. Double and triple integrals, change of order of integration, evaluation of surface areas and volumes using double integrals, calculating volumes using triple integrals.

5. **Ordinary Differential Equations:** Ordinary differential equations of the first order of the form $y'=f(x,y)$, Bernoulli's equation, exact differential equations, integrating factor, orthogonal trajectories, homogeneous differential equations, variable separable equations, linear differential equations of second order with constant coefficients, method of variation of parameters, Cauchy-Euler equation. Power series solution of differential equations, Frobenius method.

6. **Vector Calculus:** Scalar and vector fields, gradient, divergence, curl, line, surface and volume integrals, Green, Stokes and Gauss theorems.

7. **Group Theory:** Groups, subgroups, Abelian groups, cyclic groups, normal subgroups, Lagrange's Theorem for finite groups, group homomorphisms and basic concepts of quotient groups, non-Abelian groups, permutation groups.

8. **Linear Algebra:** Finite dimensional vector spaces, linear independence of vectors, basis, dimension, linear transformations, matrix representation, Rank and inverse of a matrix, determinant, solutions of systems of linear equations, consistency conditions, eigenvalues and eigenvectors for matrices, Cayley-Hamilton theorem.

9. **Real Analysis:** Finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum, Interior points, limit points, open sets, closed sets, bounded sets, connected sets, compact sets.

Syllabus for M.Sc. (Physics) Entrance Examination

1. **Mathematical Methods:** Calculus of single and multiple variables, partial derivatives, Jacobian, imperfect and perfect differentials, Taylor expansion, Fourier series. Vector algebra, Vector Calculus, Multiple integrals, Divergence theorem, Green's theorem, Stokes' theorem. First order equations and linear second order differential equations with constant coefficients. Matrices and determinants, Algebra of complex numbers.

2. **Mechanics and General Properties of Matter:** Newton's laws of motion and applications, Velocity and acceleration in Cartesian, polar and cylindrical coordinate systems, uniformly rotating frame, centrifugal and Coriolis forces, Motion under a central force, Kepler's laws, Gravitational Law and field, Conservative and non-conservative forces. System of particles, Center of mass, equation of motion of the CM, conservation of linear and angular momentum, conservation of energy, variable mass systems. Elastic and inelastic collisions. Rigid body motion, fixed axis rotations, rotation and translation, moments of Inertia and products of Inertia, parallel and perpendicular axes theorem. Principal moments and axes. Kinematics of moving fluids, equation of continuity, Euler's equation, Bernoulli's theorem.

3. **Oscillations, Waves and Optics:** Differential equation for simple harmonic oscillator and its general solution. Superposition of two or more simple harmonic oscillators. Lissajous figures. Damped and forced oscillators, resonance. Wave equation, traveling and standing waves in one-dimension. Energy density and energy transmission in waves. Group velocity and phase velocity. Sound waves in media. Doppler Effect. Fermat's Principle. General theory of image formation. Thick lens, thin lens and lens combinations. Interference of light, optical path retardation. Fraunhofer diffraction. Rayleigh criterion and resolving power. Diffraction gratings. Polarization: linear, circular and elliptic polarization. Double refraction and optical rotation.

4. **Electricity and Magnetism:** Coulomb's law, Gauss's law. Electric field and potential. Electrostatic boundary conditions, Solution of Laplace's equation for simple cases. Conductors, capacitors, dielectrics, dielectric polarization, volume and surface charges, electrostatic energy. Biot-Savart law, Ampere's law, Faraday's law of electromagnetic induction, Self and mutual inductance. Alternating currents. Simple DC and AC circuits with R, L and C components. Displacement current, Maxwell's equations and plane electromagnetic waves, Poynting's theorem, reflection and refraction at a dielectric interface, transmission and reflection coefficients (normal incidence only). Lorentz Force and motion of charged particles in electric and mag-netic fields.

5. **Kinetic theory, Thermodynamics:** Elements of Kinetic theory of gases. Velocity distribution and Equipartition of energy. Specific heat of Mono, di- and tri-atomic gases. Ideal gas, van- der-Waals gas and equation of state. Mean free path. Laws of thermodynamics. Zeroth law and concept of thermal equilibrium. First law and its consequences.

Isothermal and adiabatic processes. Reversible, irreversible and quasi-static processes. Second law and entropy. Carnot cycle. Maxwell's thermodynamic relations and simple applications. Thermodynamic potentials and their applications. Phase transitions and Clausius-Clapeyron equation. Ideas of ensembles, Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein distributions.

6. **Modern Physics:** Inertial frames and Galilean invariance. Postulates of special relativity. Lorentz transformations. Length contraction, time dilation. Relativistic velocity addition theorem, mass energy equivalence. Blackbody radiation, photoelectric effect, Compton effect, Bohr's atomic model, X-rays. Wave-particle duality, Uncertainty principle, the superposition principle, calculation of expectation values, Schrödinger equation and its solution for one, two and three dimensional boxes. Solution of Schrödinger equation for the one dimensional harmonic oscillator. Reflection and transmission at a step potential, Pauli exclusion principle. Structure of atomic nucleus, mass and binding energy. Radioactivity and its applications. Laws of radioactive decay.

7. **Solid State Physics, Devices and Electronics:** Crystal structure, Bravais lattices and basis. Miller indices. X-ray diffraction and Bragg's law; Intrinsic and extrinsic semiconductors, variation of resistivity with temperature. Fermi level. p-n junction diode, I-V characteristics, Zener diode and its applications, BJT: characteristics in CB, CE, CC modes. Single stage amplifier, two stage R-C coupled amplifiers. Simple Oscillators: Barkhausen condition, sinusoidal oscillators. OPAMP and applications: Inverting and non-inverting amplifier. Boolean algebra: Binary number systems; conversion from one system to another system; binary addition and subtraction. Logic Gates AND, OR, NOT, NAND, NOR exclusive OR; Truth tables; combination of gates; de Morgan's theorem.

Syllabus for M.Sc. (Biotechnology) Entrance Examination

1. **Molecules and their Interaction Relevant to Biology:** Structure and functions of biomolecules; Carbohydrates; Fatty acids; Lipids; Amino acids; Proteins; Nucleic acids—DNA, mRNA, tRNA, rRNA; Hormones; Vitamins; Enzymes; Bioenergetics; Cell metabolism; Protein-protein and protein-DNA interactions

2. **Cellular Organization:** Cell theory; Cell as basic unit of life; Hierarchy of cell organization; Structure and organization of prokaryotic and eukaryotic cells; Structure and function of cell organelles; Biomembranes; Cytoskeletal elements; Chromosome structure; Karyotype; Chromatin organization

3. **Fundamental Processes:** Photosynthesis; Cellular respiration; Movement through cell membrane; Nutrition; Blood clotting; Human physiological systems; Replication; Transcription; Translation; DNA repair mechanisms; Plant physiology; Bacterial growth; Microbial genetics, Secondary metabolites

4. **Cell Communication and Cell Signaling:** Tight, adherens and communicating cell junctions; Cell

adhesion molecules; Cadherins and Integrins; Extracellular matrix; Cell cycle; Basics of cancer; Basics of cell signaling; Major signaling pathways

5. **Developmental Biology and Evolution:** Stages of development; Mechanism of differentiation; Germ layers; Potency; Morphogenetic movements; Early and late development in model organisms; Cell division; Gametogenesis and fertilization in animals and flowering plants; Embryology; Seed germination; Dormancy; Evolution and natural selection; Mendel's law of heredity; Evidences of DNA as genetic information carrier; Hardy-Weinberg law; Extra- chromosomal inheritance; Sex-linked inheritance in humans; Mutations

6. **Plant and Animal Biotechnology:** Plant tissue culture techniques; Totipotency; Organogenesis and Somatic embryogenesis; Suspension culture; Protoplast isolation and somatic hybridization; Production of secondary metabolites; Basic techniques in animal cell and organ culture; Bioreactors for large scale culture of animal cells; Stem cells; Transgenic plants and animals

7. **Immunology and Vaccines:** Immunity; Antigen; Structure of antibody; Hapten; Antigen- antibody interaction, Introduction to antigen presentation; Role of MHC; Complement system; Bacterial diseases of humans; Types of vaccines; Immunization; Recombinant vaccines

8. **Diversity of Life Forms:** General characteristics of life forms; General characteristics of bacteria, fungi, algae, Microbial growth curve; plant and animal viruses; Classification of plant and animal kingdom

9. **Ecological Principles and Environmental Biology:** Ecosystem; Ecological relationships; Habitat and niche; Ecology of ecosystems; Air, water and soil pollution; Green house effect and global warming; Noise pollution; Pollution abatement; Waste water treatment; Disposal of solid wastes; Biogeochemical cycles of elements; Bioremediation; Bioleaching; Biopesticides; Biofertilizers

10. **Applied Biology:** Basics of fermentation technology; Microbes in industry; Biosensors; Biofuels; Principles of gene cloning; Methods of gene transfer; Application of biology in agriculture, health, industry and environment sectors

11. **Methods in Biology:** Basics of Centrifugation; Electrophoresis; Chromatography; Microscopy; UV-Visible spectrophotometry; Radiotracer technique; PCR; DNA sequencing; Southern blotting; Tests of significance; Analysis of variation; Correlation and regression; Hybridoma technology; Basic techniques in bioinformatics

12. **Inheritance Biology:** Mendelian principles, Extensions of Mendelian principles, Gene mapping methods, Extra chromosomal inheritance, Human genetics, Mutations, Structural and numerical alterations of chromosomes

ANNEXURE-1

CERTIFICATE FOR APPEARING IN THE FINAL SEMESTER/YEAR EXAMINATION

(Required from candidates who are yet to appear in the qualifying examination)

In connection with the application of Mr./Ms. _____

for admission to PG programme(s) at Delhi Technological University Delhi, I hereby certify that he/she is a bonafide student of our institution. He/she is yet to complete the requirements of qualifying examination including theory, practical project

examination and back paper(s)/supplementary(is) for B.A./B.Sc._____

which is to be scheduled later on (Strike out the non-applicable ones and write in the blank space if the degree is not mentioned) and the result is likely to be announced

by _____ 2019. The percentage of aggregate marks/CGPA obtained by

him/her upto pre final year examination is _____His/her conduct and

character during his/her stay at the University/University has been "GOOD".

Signature of the Principal/Dean/Registrar/

Dy. Registrar /Proctor/Administrative Officer

Name: _____   Seal : _____

Place: _____

Date: _____

UNDERTAKING BY THE CANDIDATE REGISTERED WITHOUT PRODUCTION OF PROOF OF PASSING THE QUALIFYINGEXAMINATION/APPEARED IN THE BACKPAPER(S)/SUPPLEMENTARY(IES) TILL DATE OF REGISTRATION

I, _____ son /daughter/ward of

Mr./Ms_____ hereby undertake that I have appeared in all

the examinations including practicals/projects/theory/back paper(s)/supplementary(ies) before the date of registration and only the result is awaited, which is likely to be

declared by _____.

Signature _____

Place: _____   Name _____

Date: _____   Address _____

ANNEXURE-2

AUTHORITIES WHO CAN ISSUE CASTE/TRIBE CERTIFICATE

SC/ST/OBC candidates should submit certificate issued by any of the following authorities:

District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/ Additional Deputy Commissioner/Deputy Collector/1st Class Stipendiary Magistrate/ City Magistrate/Sub-Divisional Magistrate/Taluka Magistrate/Executive Magistrate/ Extra Assistant Commissioner/Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate/Revenue Officer not below the rank of Tehsildar/ Sub-Divisional Officer of the area where the candidate and/or his/her family normally resides/Administrator/Secretary to Administrator/ Development Officer (Lakshadweep Island).

(Certificate issued by any other authority will not be accepted.)

Prescribed Format for OBC Certificate
FORM OF CERTIFICATE TO BE PRODUCED BY OTHER BACKWARD CLASSES

This is to certify that Shri / Smt. / Kum. _____

_____ Son /Daughter of Shri / Smt. _____

_____ of Village/Town _____

_____District/Division _____ in the State belongs to the _____

_____Community which is recognized

as a backward class under:

i.   Resolution No. 12011/68/93-BCC(C) dated 10/09/93 published in the Gazette of India Extraordinary Part I Section I No. 186 dated 13/09/93.

ii. Resolution No. 12011/9/94-BCC dated 19/10/94 published in the Gazette of India Extraordinary Part I Section I No. 163 dated 20/10/94.

iii. (Resolution No. 12011/7/95-BCC dated 24/05/95 published in the Gazette of India Extraordinary Part I Section I No. 88 dated25/05/95.

iv. Resolution No. 12011/96/94-BCC dated 9/03/96. (v)Resolution No. 12011/44/96-BCC dated 6/12/96 published in the Gazette of India Extraordinary Part I Section I No. 210 dated 11/12/96.

v.   Resolution No. 12011/13/97-BCC dated 03/12/97.

vi. Resolution No. 12011/99/94-BCC dated 11/12/97.

vii. Resolution No. 12011/68/98-BCC dated 27/10/99.

viii. Resolution No. 12011/88/98-BCC dated 6/12/99 published in the Gazette of India Extraordinary Part I Section I No. 270 dated 06/12/99.

ix. Resolution No. 12011/36/99-BCC dated 04/04/2000 published in the Gazette of India Extraordinary Part I Section I No. 71 dated04/04/2000.

x. Resolution No. 12011/44/99-BCC dated 21/09/2000 published in the Gazette of India Extraordinary Part I Section I No. 210 dated21/09/2000.

xi. Resolution No. 12015/9/2000-BCC dated 06/09/2001.

xii. Resolution No. 12011/1/2001-BCC dated 19/06/2003.

xiii. Resolution No. 12011/4/2002-BCC dated 13/01/2004.

xiv. Resolution No. 12011/9/2004-BCC dated 16/01/2006 published in the Gazette of India Extraordinary Part I Section I No. 210 dated 16/01/2006.

Shri / Smt. / Kum. _____

and / or his family ordinarily reside(s) in the _____

District / Division of _____ State. This is also to certify that he/

she does not belong to the persons/sections (Creamy Layer) mentioned in Column 3 of the Schedule to the Government of India, Department of Personnel & Training O.M. No. 36012/22/93-Estt. (SCT) dated 08/09/93 which is modified vide OM No. 36033/3/2004 Estt. (Res.) dated 09/03/2004.

Dated: _____

District Magistrate / Deputy Commissioner /
Competent Authority
Seal

NOTE:

a. The term 'Ordinarily' used here will have the same meaning as in Section 20 of the Representation of the People Act, 1950.

b. The authorities competent to issue Caste Certificates are indicated below:

   i. District Magistrate / Additional Magistrate / Collector / Deputy Commissioner / Additional Deputy Commissioner / Deputy Collector / Ist Class Stipendiary Magistrate / Sub-Divisional magistrate / Taluka Magistrate / Executive Magistrate / Extra Assistant Commissioner (not below the rank of Ist Class Stipendiary Magistrate).

   ii. Chief Presidency Magistrate / Additional Chief Presidency Magistrate / Presidency Magistrate.

   iii. Revenue Officer not below the rank of Tehsildar' and

   iv. Sub-Divisional Officer of the area where the candidate and / or his family resides.

Declaration/undertaking - for OBC Candidates only

I,_____

son/daughter of Shri _____ resident of village/town/

city _____ district _____

State _____ hereby declare that I belong to the _____

community which is recognized as a backward class by the Government of India for the purpose of reservation in services as per orders contained in Department of Personnel and Training Office Memorandum No.36012/22/93- Estt. (SCT), dated 8/9/1993. It is also declared that I do not belong to persons/sections (Creamy Layer) mentioned in Column 3 of the Schedule to the above referred Office Memorandum, dated 8/9/1993, which is modified vide Department of Personnel and Training Office Memorandum No.36033/3/2004 Estt. (Res.) dated 9/3/2004.

Signature of the Candidate

Place: _____

Date: _____

ANNEXURE-3

Certificate for Person with Disability to be issued by Medical Board from Government Hospital

Name of the candidate: Mr./Ms.*_____

Father's Name:_____

Permanent Address:_____

Percentage loss of earning capacity (in words): Whether the candidate is otherwise able to carry on the studies and perform the duties of an engineer/architect satisfactorily:

_____.

Name of the disease-causing handicap: _____

Whether handicap is temporary or permanent: _____

Whether handicap is progressive or non-progressive: _____

The candidate is FIT / UNFIT to pursue further studies.

(*Strike out whichever is not applicable)

Member   Member   Principal Medical Officer
                                                                                           (Orthopaedic Specialist)
                                                                                              Seal of Office:

Date: _____

NOTE:

1. The medical board must have one orthopaedic specialist as its member.

2. Candidate having temporary or progressive handicap will not be considered against the seats.

ANNEXURE-4

Government of.................

(Name & Address of the authority issuing the certificate)

INCOME & ASSET CERTIFICATE TO BE PRODUCED BY ECONOMICALLY WEAKER SECTIONS

Certificate No. _____

Date: _____

VALID FOR THE YEAR_____

This is to certify that Shri/Smt./Kumari_____ son/daughter/wife of

_____ permanent resident of_____

Village/Street_____ Post Office_____ District_____

in the State/Union Territory_____ Pin Code_____

whose photograph is attested below belongs to Economically Weaker Sections, since the gross annual income* of his/her family** is below Rs. 8 lakh (Rupees Eight Lakh only)

for the financial year_____. His/her family does not own or possess any of the

following assets***:

i. 5 acres of agricultural land and above;

ii. Residential flat of 1000 sq. ft. and above;

iii. Residential plot of 100 sq. yards and above in notified municipalities;

iv. Residential plot of 200 sq. yards and above in. areas other than the notified municipalities.

Shri/Smt./Kumari_____ belongs to the_____

caste which is not recognized as a Scheduled Caste, Scheduled Tribe and Other Backward Classes (Central List)

Name _____   Signature with seal of Office

Designation_____

*Note 1: Income covered all sources i.e. salary, agriculture, business, profession, etc.

**Note 2:The term 'Family' for this purpose include the person, who seeks benefit of reservation, his/her parents and siblings below the age of 18 years as also his/her spouse and children below the age of 18 years.

***Note 3: The property held by a "Family' in different locations or different places/cities have been clubbed while applying the land or property holding test to determine EWS status.

INCOME AND ASSET CERTIFICATE ISSUING AUTHORITY

The Income and Asset Certificate issued 'by any one of the following authorities in the prescribed format

as given above shall only be accepted as proof of candidate's claim as 'belonging to EWS: -

i. District Magistrate/Additional District Magistrate/ Collector/ Deputy Commissioner/Additional Deputy Commissioner/ 1st Class Stipendiary Magistrate/ Sub-Divisional Magistrate/ Taluka Magistrate/ Executive Magistrate/ Extra Assistant Commissioner,

ii. Chief Presidency Magistrate/Additional Chief Presidency Magistrate/ Presidency Magistrate,

iii. Revenue Officer not below the rank of Tehsildar and

iv. Sub-Divisional Officer or the area where the candidate and/or his family normally resides.

CONTACT US

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