**YMCA UNIVERSITY OF SCIENCE &
TECHNOLOGY
FARIDABAD**

(Established by Haryana State Legislative Act No.21 of 2009,
Approved by AICTE & Recognized by U.G.C. U/s. 2(f) and 12(B) of U.G.C. Act 1956)

## PhD Admission -2016

### ADMISSION SCHEDULE FOR Ph. D.

### KEY DATES

1. Availability of Prospectus and Application Form: 10-03-2016 (Thursday).

   (University Website: www.ymcaust.ac.in).

2. Last date for receipt of Application forms duly filled in for admission at the University: 12.04.2016 up to 4.00 P.M. (Tuesday).

3. The list of the candidates eligible for entrance and exempted from entrance will be displayed on University web site on 21-04-2016 (Thursday).

4. Date &Time of Entrance Test: 24.04.2016 (Sunday), 10:00 A.M. -12:00 noon.

5. Declaration of Results: 25.04.2016 (Monday)

6. Date of Interview & Counseling by respective Departments Chairperson: 28.04.2016(Thursday).

7. Declaration of Results: 29.04.2016(Friday)

8. Course fee submission by selected candidate: 2-5-2016

9. Date of Commencement of the course work classes: 10.05.2016 (Tuesday).

10. For more details kindly refer to http://www.ymcaust.ac.in/ordinance/phd_ordinance

**NOTE:**

Application form can be down loaded from University Website i.e. www.ymcaust.ac.in and the filled in application forms to be submitted along with documents and a DD of Rs.1000/- (Rs.500/- for SC / ST Category) in the favour of 'Registrar, YMCAUST Faridabad' payable at Faridabad by 12.04.2016 (4.00 PM).

**GENERAL INFORMATION**

1. The Application Form for admission is given at the end.

2. The duly completed Application Form along with all required enclosures should reach the office of the Research Coordinator of the University by the **last date as specified**, at the following address:

   **Research Coordinator**
   **YMCA University of Science & Technology**
   **Sector-6, FARIDABAD - 121006 (Haryana)**

   No application will be entertained thereafter.

3. A candidate who furnishes particulars which are found to be false or suppresses material information, will not be considered for admission and if he/ she is admitted on such information, legal action under the law of the land, his/ her admission shall be cancelled as per University rules and all fees deposited by him/ her will stand forfeited.

4. Before accepting the admission, the candidate must also ensure that he/ she fulfills the minimum eligibility conditions. Fee once paid will not be refunded.

5. The minimum period of Ph.D. registration will be 03 years for a part- time scholar after DRC.

6. Students have to fill the Roll No slip given at the end of the form and bring at the time of entrance examination. No separate call letter will be issued by the University.

7. All the admitted candidates will be governed by the Academic Regulation and/ or Ordinance as laid down by the University and amended from time to time.

8. In the case of any inconsistencies in the rules or any clarification thereof, the matter shall be referred to the competent authority for interpretation whose decision shall be final.

9. Detailed ordinance is available at University website.

10. Candidate without depositing the application fee shall not be considered for entrance test.

# Introduction

Ph.D program was started in YMCA in the year 2010. Till now more than 151 students of 2010, 2011, 2012, 2014 and 2015 batches are enrolled for Ph.D. programmes in the discipline of Mechanical Engineering, Electrical Engineering, Electronics Engineering, Computer Engineering, Management, Physics, Environmental Sciences and Mathematics.

## Fee Structure

### At the time of admission:

**Fee for Pre Ph.D. Course = Rs 10,000/-(Ten thousand only)**
**(Candidates must bring a DD of Rs 10,000/- at the time of admission in the favour of "Registrar, YMCAUST, Faridabad" payable at Faridabad).**

### Seats for Part-time Ph.D. Courses

| S.No | Name of the Department | No of seats | Area(s) in which Ph.D is offered |
|------|------------------------|-------------|----------------------------------|
| 1 | Mechanical Engineering | 07 | Material Technology, Fluid, energy, thermal, Advanced manufacturing, Design, Manufacturing |
| 2 | Computer Engineering | 08 | Information retrieval, software testing, natural language processing, cloud computing, NM, Big data, IOT, adhoc network, Database |
| 3 | Electrical Engineering | 05 | Power system, Power quality, Electric drive |
| 4 | Electronics Engineering | 03 | Image Processing, Networking, Embedded system, power electronics, Micro electronics, Electronic materials, VLSI Design |
| 5 | Mathematics | 02 | Pure and Applied Mathematics |
| 6 | English | 02 | English Literature |
| Total | | 27 | |

**Note:**

**The reservation policy of the Haryana Govt. shall be applicable and all the reserved seats are meant for Haryana Domicile candidate only.**

**Reservation certificate must be signed by Tehsildar of concerned area of Haryana State. Format as per HSTES ([www.hstes.in)/Annexure in the Prospectus. HOGC](www.hstes.in) candidate will also eligible for AIC seat.**

### Eligibility

(i)     A candidate for admission to the course of of Ph.D must have obtained 60% marks at the regular master's degree level or any other equivalent examinations in relevant field or in an allied subject.  The relevance of the subject will be decided by the Board of Studies (BOS).

(ii)    The candidates who appeared in regular master's level examination in the current session may also appear in the entrance test.  But they must submit the proof of having passed the examination on the pre-designated date before admission to the Pre-Ph.D course.

(iii)   The state reservation policy shall be followed in Ph.D Admission.

(iv)   A candidate provisionally registered for Ph.D shall be required to attend classes for one semester for a Pre-Ph.D course.

### Additional Eligibility Conditions for Part-Time Ph.D Admission

(i)     The applicant should be an employee of an educational institute/organization/Industry and must produce No Objection Certificate (NOC) from his employer on or before the interview.

(ii)    The candidate proves to the satisfaction of the DRC that his/her official duties permit him to devote sufficient time to research.

(iii)   The candidate proves to the satisfaction of the DRC that facilities for pursuing research are available at his place of work in the chosen field of research.

(iv)   He will be required to visit university (on working days) to meet his supervisor in the department at least twice in a month and such visit is to be reported to the chairman- DRC for record.

**NOTES:**

1.  The eligible applicants will have to qualify the Ph.D. Entrance Test (PET). This test will be of 2 hours duration having 80 questions of one mark each. **80 questions will be of concerned discipline / branch (see syllabus attached).**

2.  The eligible applicants will have to qualify the prescribed Entrance Test by securing at least 40% marks in the entrance test. There will be deduction of 0.25 marks for each wrong answer. The applicants who have qualified and valid GATE/UGC/NET/CSIR (JRF)/SLET/ passed regular M.Phil Programme in the related discipline are exempted.

    The successful applicants i.e. eligible applicants, who will qualify the entrance Test or otherwise exempted shall be tested by the DRC through seminar/ presentation/ interview.

**The merit list shall be prepared by Department according to the following criteria:**

**For Sciences/Management**
(a)      40% marks of the percentage of marks in the Master's degree M.Sc./MBA.
(b)      20 % marks of the percentage of marks in the Bachelor's degree.
(c)      20% marks in the interview to be conducted by the respective Department.
(d)      10% marks (02 marks per year experience subject to max.10 marks).
(e)      10% marks (02 marks for each publication in refereed Journal subject to max.10marks)

**For Engineering &Technology**
(a)      40% marks of the percentage of marks in the M.Tech.
(b)      20 % marks of the percentage of marks in the B.Tech./MCA.
(c)      20% marks in the interview to be conducted by the respective Department.
(d)      10% marks (02 marks per year experience subject to max.10 marks).
(e)      10% marks (02 marks for each publication in refereed Journal subject to max.10marks)

**Where CGPA is awarded and percentage of marks is not mentioned,**
**Percentage of marks = 9 x CGPA**

3.  No separate admit cards will be issued for the entrance test. Applicants are required to download their admit cards from the University website or can obtain from the office of the Research Coordinator during working hours.

4.  The LIST OF SUCCESSFUL APPLICANT will be displayed on University website and notice boards. The successful applicants will report to the **Chairperson of the respective teaching department on the scheduled date for interview/Admission**.

## (I) MECHANICAL ENGINEERING

### Applied Mechanics and Design

**Engineering Mechanics:**
Equivalent force systems, free-body concepts, equations of equilibrium, trusses and frames, virtual work and minimum potential energy. Kinematics and dynamics of particles and rigid bodies, impulse and momentum, energy methods, central force motion.

**Strength of Materials:**
Stress and strain, Elastic constants, stress-strain relationship, Mohr's circle, deflection of beams, bending and shear stress, shear force and bending moment diagrams, torsion of circular shafts, thin thick cylinders, Eulers theory of columns, strain energy methods, thermal stress.

**Theory of machines:**
Analysis of plane mechanisms, dynamic analysis of slider-crank mechanism, planer cams and followers, gear tooth profiles, kinematics and design of gears, governors and flywheels, balancing of reciprocating and rotating masses.

**Vibrations:**
Free and forced vibrations of single degree freedom systems, effect of damping, vibration isolation, resonance, critical speed shafts.

**Design of Machine Elements:**
Design for statics and dynamic loading, fatigue strength, failure theories, design of bolted, riveted and welded joints, design of shafts and keys, design of spur gears, brakes and clutches, rolling and sliding contact bearings, belt, ropes and chain drives.

### Thermal Science/ Thermal Engineering

**Fluid Mechanics:**
Fluid properties, fluid statics, manumetry, buoyancy, control-volume analysis of mass, momentum and energy, fluid acceleration, differential equation of continuity and momentum. Bernouli's equation. Viscous flow of incompressible fluids; boundary layer, flow through pipes, head losses in pipes, bends etc.

**Turbo machines:**
Velocity triangles Euler's equation, specific speed, Pelton wheel, centrifugal pump, Francis and Kaplan turbines.

**Heat-Transfer:**
Modes of heat transfer, one dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction, fins, dimensionless parameters in free and forced

convective heat layer, effect of turbulence, radioactive heat transfer, black and grey surfaces shape factors, network analysis, heat exchanger performance, LMTD and NTU methods.

**Thermodynamics:**

Zeroth, fact and second laws of thermodynamics, thermodynamic system and processes, irreversibility and availability, behaviour of ideal and real gases, properties of pure substances, calculation of work and heat in ideal processes. Analysis of thermodynamics cycles related to energy conversion. Carnot, Rankine, Otto, Diesel, Brayton and Vapour compression cycle.

**Steam engineering:**

Steam generators, Steam engines, steam turbines-impulse and reaction, velocity diagrams, compounding, reheat factor.

**I.C. Engines:**

Requirements and suitability of fuels in IC engines, fuel ratings, fuel- air mixture requirements, normal combustion in SI and CI engines, engine performance calculations, components of gas turbine.

**Reciprocating Air Compressor:**

Isothermal, adiabatic and polytropic compression, staging the compression process, intercooling and aftercooling, minimum work requirement, volumetric efficiency. Centrifugal and aial flow compressors.

**Refrigeration and air-conditioning:**

Refrigerant compressors, expansion devices, condensers and evaporators, properties of moist air, psychometric chart, basic psychometric processes.

**Manufacturing and Industrial Engineering**

**Engineering materials:**

Structure and properties of engineering materials and their applications, heat treatment.

**Metal casting:**

Casting processes- pattern making, moulds and cores, solidification, design of casting, casting defects.

**Metal working:**

Stress-strain diagrams for ductile and brittle material, plastic deformation, mechanisms, fundamentals of hot and cold working processes-forging, extrusion, wire drawing, sheet metal working, punching, blanking, bending, deep drawing, coining and spinning.

**Machining Processes and Machine Tool Operation:**

Mechanics of metal cutting, single and multipoint cutting tools, geometry and machining aspects, tool life, machinability, economics of machining, non- traditional machining processes.

**Metrology and Inspection:**

Limits, fits and tolerances, linear and angular measurements, comparators, gauge design interferometry, form and finish measurement, measurement of screw threads, alignment and testing methods.

**Tool Engineering:**

Principles of work holding, design of jigs and fixtures, design of press working tools.

**Manufacturing Analysis:**

Part-print analysis, tolerance analysis in manufacturing and assembly, time and cost analysis.

**Computer Integrated Manufacturing:**

Basic concepts of CAD, CAM , Group technology.

**Work Study:**

Method study, work measurement time study, work sampling, job evaluation, merit rating.

**Production planning and control:**

Forecasting models, aggregate production planning, master scheduling, materials requirements planning.

**Inventory control:**

Deterministic and probabilistic models, safety stock inventory control systems.

**Operations Research:**

Linear programming, simplex and duplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

## (II) ELECTRICAL ENGINEERING

**Power System**

Transmission line parameters: Representation of short, medium, and long transmission lines-ABCD Parameters , Circle Diagram, per Unit representation,3-$\Phi$ system, Short Circuit Studies, Sequence Network, Load- Flow Studies-Gauss Seidel method, Newton- Raphson Method, Automatic Generation Control, Load- Frequency Control, Automatic Voltage Regulator, Power system Stability- Equal area criteria, Swing Equation, Optimal Load Dispatch in Power System. Protection Schemes for Transformer, Generators and Transmission Lines.

**Power Electronics and Drives**

Characteristics and ratings of different thyristor family devices, their turn on and off methods with their protection, series and parallel connection of SCRs and their derating.

controlled single phase and three phase rectifiers for different types of load viz R,R-L,R-L-E, single phase and three phase voltage source and current source inverter, choppers, PWM techniques, Characteristics and principle of AC and DC Machines, Methods of conventional controls and application of static controls and microprocessor based controls for AC and DC machines.

**Control and Instrumentation**

Mathematical Molding of physical systems, Transfer function of linear systems. Steady state errors and error constants , static coefficients Time domain analysis. Stability of control system. Routh- Hurwitz's stability criterion. Root locus plots , analysis of control system by root loci. Relationship between time and frequency response, Polar plot, Bode's Plot. Nyquist plot and Nyquist stability criterion. Relative Stability. Phase and Gain Margins. Constant M and N circle. Design of Feedback Controllers. Design of  proportional, integral, Derivative, PI, PID controllers of first, second  order systems. Control loop with auxiliary feedback. Feed forward control, Practical  Controller tuning  tips. Ziegler-Nichol's tuning methods. Compensation design using Bode Diagram and Root Locus technique. Reshaping the Root Locus. Cascade Lag, Lead and Lag-Lead compensators. State Variable concepts. State  model , State  transition matrix, conversion of  starte - variable modes to transfer functions, conversion of transfer  function to canonical state- variable models, solution of state equation, concepts of controllability and absorbability, stability improvement by state feedback, Necessary and sufficient conditions  for arbitrary pole placement, State regulator theory, design of state observer Servo Design. Introduction of reference input by feed forward control. Recent advances in control system design technologies.

Classification of Instruments, Moving Iron, Moving Coil, Permanent magnet and Dynamometer types. Thermal, Electrostatic Rectifier Instruments, transforms, CT, PT, Power measuring instruments, power factor, frequency meters and synchroscope.

Measurement of low, medium and high resistances AC and DC measuring bridges, Magnetic measurement. General Transducers  voltage, current phase angle, optical Hall effect and industrial transducers Electronic voltmeters, Vacuum  tube Voltmeter (VTVM) data acquisition system.  Spectrum analyses, sensors measuring or sensing devising in different application, Generalized performance characteristics of the measuring instruments. Physical and chemical sensors, principle of working of physical and chemical sensors , interface electronics circuits  for instruments/ sensor for data manipulation , transmission and recording computer aided measurement of voltage current power energy frequency phase angle. High voltage measurement.


## (III) ELECTRONICS AND COMMUNICATION ENGINEERING

**Networks:**
Network graphs: matrices associated with graphs; incidence, fundamental cut set and fundamental circuit matrices. Solution methods: nodal and mesh analysis. Network theorems: superposition, Thevenin and Norton's maximum power transfer, Wye-Delta transformation. Steady state sinusoidal analysis using phasors. Linear constant coefficient differential equations; time domain analysis of simple RLC circuits, Solution of network equations using Laplace transform: frequency domain analysis of RLC circuits. 2-port network parameters: driving point and transfer functions. State equations for networks.

**Electronic Devices:**

Energy bands in silicon, intrinsic and extrinsic silicon. Carrier transport in silicon: diffusion current, drift current, mobility, and resistivity. Generation and recombination of carriers. p-n junction diode, Zener diode, tunnel diode, BJT, JFET, MOS capacitor, MOSFET, LED, p-I-n and avalanche photo diode, Basics of LASERs. Device technology: integrated circuits fabrication process, oxidation, diffusion, ion implantation, photolithography, n-tub, p-tub and twin-tub CMOS process.

**Analog Circuits:**

Small Signal Equivalent circuits of diodes, BJTs, MOSFETs and analog CMOS. Simple diode circuits, clipping, clamping, rectifier. Biasing and bias stability of transistor and FET amplifiers. Amplifiers: single-and multi-stage, differential and operational, feedback, and power. Frequency response of amplifiers. Simple op-amp circuits. Filters. Sinusoidal oscillators; criterion for oscillation; single-transistor and op-amp configurations. Function generators and wave-shaping circuits, 555 Timers. Power supplies.

**Digital circuits:**

Boolean algebra, minimization of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinatorial circuits: arithmetic circuits, code converters, multiplexers, decoders, PROMs and PLAs. Sequential circuits: latches and flip-flops, counters and shiftregisters. Sample and hold circuits, ADCs, DACs. Semiconductor memories. Microprocessor(8085): architecture, programming, memory and I/O interfacing.

**Signals and Systems:**

Definitions and properties of Laplace transform, continuous-time and discrete-time Fourier series, continuous-time and discrete-time Fourier Transform, DFT and FFT, z-transform. Sampling theorem. Linear Time-Invariant (LTI) Systems: definitions and properties; causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay. Signal transmission through LTI systems.

**Control Systems:**

Basic control system components; block diagrammatic description, reduction of block diagrams. Open loop and closed loop (feedback) systems and stability analysis of these systems. Signal flow graphs and their use in determining transfer functions of systems; transient and steady state analysis of LTI control systems and frequency response. Tools and techniques for LTI control system analysis: root loci, Routh-Hurwitz criterion, Bode and Nyquist plots. Control system compensators: elements of lead and lag compensation, elements of Proportional-Integral

Derivative (PID) control. State variable representation and solution of state equation of LTI control systems.

**Communications:**
Random signals and noise: probability, random variables, probability density function, autocorrelation, power spectral density. Analog communication systems: amplitude and angle modulation and demodulation systems, spectral analysis of these operations, superheterodyne receivers; elements of hardware, realizations of analog communication systems; signal-to-noise ratio (SNR) calculations for amplitude modulation (AM) and frequency modulation (FM) for low noise conditions. Fundamentals of information theory and channel capacity theorem. Digital communication systems: pulse code modulation (PCM), differential pulse code modulation (DPCM), digital modulation schemes: amplitude, phase and frequency shift keying schemes (ASK, PSK, FSK), matched filter receivers, bandwidth consideration and probability of error calculations for these schemes. Basics of TDMA, FDMA and CDMA and GSM.

**Electromagnetics:**
Elements of vector calculus: divergence and curl; Gauss' and Stokes' theorems, Maxwell's equations: differential and integral forms. Wave equation, Poynting vector. Plane waves: propagation through various media; reflection and refraction; phase and group velocity; skin depth. Transmission lines: characteristic impedance; impedance transformation; Smith chart; impedance matching; S parameters, pulse excitation. Waveguides: modes in rectangular waveguides; boundary conditions; cut-off frequencies; dispersion relations. Basics of propagation in dielectric waveguide and optical fibers. Basics of Antennas: Dipole antennas; radiation pattern; antenna gain.

## (IV) COMPUTER ENGINEERING

**Digital Logic:** Logic functions, Minimization,; Number representation and computer arithmetic (fixed and floating point).

**Programming and Data Structures:** Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked lists, Trees, Binary search trees, Binary heaps.

**Algorithms:** Asymptotic notation & Analysis, Notions of space and time complexity, Worst and average case analysis; Design: Greedy approach, Dynamic programming, Divide-and-conquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching. Basic concepts of complexity classes - P, NP, NP-hard, NP-complete.

**Theory of Computation & Compiler Design:** Regular languages and finite automata, Context free languages and Push-down automata, Lexical analysis, Parsing.

**Operating systems:** Processes, Threads, Inter-process communication, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory

**Databases:** ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL)

**Software Engineering**: Process models, Software design concepts: coupling & cohesion, testing methods: white box, black box.

**Computer Networks:** ISO/OSI stack, TCP/IP model, Basic concepts of hubs, switches, gateways, and routers. Network security - basic concepts of public key and private key cryptography, digital signature, firewalls.

**Web technologies:** HTML, XML, basic concepts of client-server computing.

# (VI) ENGLISH

**LITERATURE IN ENGLISH: 1550-1660**

Philip Sidney: The following Sonnets from Astrophel and Stella **,** John Donne: from The Metaphysical Poets ed. Helen Gardner (Penguin) John Milton: Paradise Lost, Book-I**,** William Shakespeare: As You Like It and King Lear**,** Ben Jonson's Volpone, Francis Bacon's essays, Machiavelli excerpts from The Prince

**LITERATURE IN ENGLISH: 1660-1798**

John Dryden: Absalom and Achitophel, Alexander Pope: The Rape of the Lock.**,** William Congreve: The Way of the World. Richard Sheridan: The School for Scandal. Daniel Defoe: Robinson Crusoe.Henry Fielding: Tom Jones. (i) Joseph Addison's articles (ii) Richard Steele articles (iii) Samuel Johnson: "On Fiction", "Cowley", "Milton" from Live the Poets.Jean Jacques Rousseau: Confessions.

**LITERATURE IN ENGLISH: 1798-1914**

Wordsworth, Keats, Coleridge, and Browning**,** Charles Dickens : Hard Times George Eliot:The Mill on the Floss. Thomas Hard: Tess of d Urbervilles. Bernard Shaw: Arms and the Man. Gustav Flaubert Madame Bovarv. S.T. Coleridge, Matthew Arnold, Thomas Carlyle, Wuthering Heights, Joseph Conrad's Heart of Darkness, Mary Shelley's Frankenstein, Sir Walter Scott's Ivanhoe, WM Thackeray Vanity Fair.

**LITERATURE IN ENGLISH: 1914-2000**

T.S. Eliot: "The Waste Land", Philip Larkin, Nissim Ezekiel,E.M. Forster: A Passage to India. Background Reading: To The Light house, The Power and the Glorv, The Serpent and the Rope, The Rainbow, July's People, Look Back in Anger, Vijay Tendulkar, Manohar Malgonkar, Ruth Jhabvala, My Experiments with Truth by M.K. Gandhi. George Orwell: Nineteen Eighty Four. R.K. Narayan: The Guide Arthur Miller: Death of a Salesman, Albert Camus: The Outsider

## CRITICAL THEORY

Aristotle: Poetics, Bharatmuni : Natyashastra (Ed. Dr. N.P. Unni) Chapter-I and VII, Horace: Ars Poetica Dr. Johnson: Preface to Shakespeare, Background Reading Plato on Poetry, Neo-Platonism, Longinus on Sublime, Plotinus on Beauty, Apologie for Poetry *by Philip Sidney*, Essay of Dramatic Poesy by John Dryden, Boccaccio on Poetry, French Neoclassicism, Essay on Criticism by Alexander Pope. William Wordsworth: Preface to Lyrical Ballads Matthew Arnold: Selections from Essays in Criticism "The Function of Criticism at the Present Time" "The Study of Poetry" "John Keats" T.S. Eliot: "Tradition and the Individual Talent" I.A. Richards: Chapters XXVII and XVIII of Principles of Literary Criticism ("Levels of Response and the Width of Appeal" and "The Allusiveness of Modern Poetry") Saussure: "The Object of Study" Jakobson: "The Metaphoric and Metonymic Poles" M.H. Abrams: "The Deconstructive Angel" T.S.Eliot's "The Function of Criticism", E.M.Forster on "Flat" and "Round" Characters, Foster on "Point of View", W.K.Wimsatt and M.C. Beardslay on "The Intentional Fallacy", Wimsatt and Beardslay on" The Affective Fallacy" , Raymond Williams' "Realism and the contemporary Novel" , "Lionel Trilling's "Freud and Literature", Psychoanalytical criticism, Post-structuralism, New Historicism.

## AMERICAN LITERATURE

Walt Whitman; Emily Dickinson; Mark Twain: The Adventures of Huckleberry Finn; Henry James:The Portrait of a Lady Robert Frost's selected poems. Ernest Hemingway: The Sun Also Rises Eugene O'Neill:The Hairy Ape Tennessee Williams: A Streetcar Named Desire **INDIAN**

## WRITING IN ENGLISH

Sri Aurobindo: Savitri, Book IV, Kamala Das:Jayant Mahapatra's poems, Mulk Raj Anand:Coolie, NB: Assorted from Ten Twentieth Century Indian Poets Raja Rao: Kanthapura Anita Dasai: Voices in the City Asif Currimbhoy: Goa S. Radhakrishnan: The Hindu View of Life.

# (VI) MATHEMATICS

**Algebra :**

Groups, homomorphism, Sylow theorems. Rings and fields. Vector spaces, subspaces, linear dependence, basis and dimension. Linear transformation, range space, null space, rank and nullity. Matrix representation of a linear transformation. Change of basis. Eigenvalues and eigenvectors. Inner product, orthogonality, Gram-Schmidt process, orthogonal expansion. Quadratic forms, reduction to normal form.

**Analysis :**

The real number system. Sequences, series and uniform convergence. Continuity and differentiability of functions of real variable. Riemann and Lebesgue integrals. Analytic function, Cauchy Riemann equations, Cauchy's theorem and integral formula, singularities, Taylor's and Laurant's series. Cauchy's residue theorem and applications.

Metric spaces.Cauchy sequences and convergence. Completeness. Normed space. Banach space. Inner product space. Hilbert space.

**Differential Equations :**

Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations. Second order linear differential equations. Variation of parameters. Systems of linear equations. Solution by matrix method. Laplace transform methods. Applications. Sturm-Liouville problem. Green's function. First and second order partial differential equations. Method of separation of variables for Laplace, heat and wave equations.

**Operations Research :**

Linear programming problems, convex set, convex functions, Simplex method and its variants, duality, sensitivity analysis. Transportation problems, initial basic feasible solution and optimal solution, degeneracy. Assignment problems, applications of TP and AP. Nonlinear programming problems, Kuhn-Tucker conditions.

**Numerical Analysis :**

Approximation of functions, their derivatives and integrals by interpolation. Finite and divided differences. Iterative methods for solving nonlinear and linear equations, convergence. Power method for largest eigenvalue. Numerical Solution of ordinary differential equations. Initial value problems by Runge-Kutta and predictor-corrector methods. Boundary value problems by finite difference methods and method of weighted residuals. Numerical Solution of Laplace and Poisson equations.

# YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY
## Sector 6, Faridabad

Affix a Passport size
Photograph (attested).

Four Passport size
photographs will also
be required at the time
of admission.

**APPLICATION FORM FOR ADMISSION TO Ph D 2016-17**

**Date and time of Entrance Test at YMCA UST Faridabad.**
**24/4/16 (Sunday) from 10.00 a.m. to 12.00 noon.**

**For Part time Course in:**
**(Mechanical/Electrical/Electronics/English/ComputerEngg./Mathematics)**

1.  Ph.D (Part time) Certificate from employer (Y / N) ……………….

    (Attach attested No Objection Certificate for Part time in prescribed format otherwise application will not be considered)

1.1 Tick the relevant discipline (Area available) for admission to Ph.D Programme

I)   ENGLISH. (Area for Part-time Ph.D: Literature)

II)  MECHANICAL ENGINEERING (Area for Part-time Ph.D: Material Technology, Fluid, energy, thermal, Advanced manufacturing, Design, Manufacturing)

III) ELECTRICAL ENGG.( Area for Part-time Ph.D: Power system, Power quality, Electric drive )

IV) COMPUTER ENGINEERING (Area for Part-time Ph.D: Information retrieval, software testing, natural language processing, cloud computing, NM, Big data, IOT, adhoc network, Database)

V)  ELECTRONICS ENGG.( Area for Part-time Ph.D: Image Processing, Networking, Embedded system, power electronics, Micro electronics, Electronic materials, VLSI Design)

VI)  MATHEMATICS: (Pure and Applied Mathematics)

2.(i) CATEGORY: General (AIC/HOGC)/(SC/ST,BC, SBC, PH, others) :_____
    (Attach attested certificates in format given in Annexure)

(ii) Exempted from ENTRANCE TEST  Yes OR No (Attach proof, If Yes as per prospectus):   ……….

3. Name of full (in block letters)                    :_____

4. Father's Name (in block letters)                   :_____

5. Mother's Name (in block letters)            :_____

6. Date of Birth (Attested copy of 10th Certificate)      :_____

7. Address for correspondence             :_____

_____

Tel……………………………………………………………….

Mobile…………………………………………………..

E-Mail………………………………………………………………………………………………
………………….…..……..

8. Details of Qualifying Examination passed (B.Tech/B.E/Bachelor/MCA and M.Tech/M.E./M.Sc./MBA etc, attach attested copy):-

| Examination with discipline | Year | Related roll No. | Marks Obtained | Maximum Marks | %age of Marks | Name of College/ University |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

9 Number of Research publications in Referred Journal (Attach photocopy as a proof)    ……..

10 Employment Record (Attach experience certificate, post qualification exp will be considered only):

| Name of Employer's | Period of Employment | Designation & Salary | Nature of Duties |
|---|---|---|---|
| | | | |
| | | | |

11**. To be produced at the time of Ph.D. interview**: Area, Topic, List of Projects/Publications/Inventions/Patents and a paragraph comprising of maximum 500 words.

12. DD./Receipt No……………………………..Amount………………………… dated …………………………………
Bank………………………………………………………………………………………………
………………………………...

**Signature of the Applicant**

## DECLARATION BY THE CANDIDATE

I hereby solemnly affirm that all the entries made in this form are correct. I further declare that I fulfill the minimum eligibility conditions laid down for admission. In case of detection of any false entry, especially in respect of degree examination / experience / sponsoring certificate, my admission may be treated as cancelled any time during the course of my study and I will no claim what-so-ever.

I have noted carefully that in case my candidature is not registered by this University on any ground what-so-ever, my admission will be treated as cancelled automatically and I would have no claim for admission in my Ph.D. Course.

**Signature of Applicant**

## DECLARATION BY THE FATHER / GUARDIAN

I hereby certify that my son / daughter / ward_____submits the application for admission to Ph.D with my knowledge and consent and I hold myself responsible for his good conduct and for his maintenance and payment of fees during the period he/she is on the University Rolls.

**Date:_____**                                                                 **Signature of Father / Guardian**

<center>**NO OBJECTION CERTIFICATE FOR Ph.D. Part Time Candidates**</center>

**(To be printed on Letter Head mentioning Tel. no. , Website of organization. Incomplete certificate will not be considered)**

Certified that Mr./Ms._____ S/o / D/o

Shri_____ working as

_____ in the department

of _____ from

(date) _____is a regular employee of this

department/organization. He /She fulfils the minimum eligibility conditions laid down for admission to this course. The Institute has no objection if the above candidate is selected for Ph.D. He /She will be relieved to join the Ph.D. Degree course work.

Date_____                              Signature of the Head of Institute

No._____                              with Stamp

Tel. of organization……………                    Website: ……………….

**List of documents, which should be attached to the Application Form.**

a) Attested photo copy of certificate showing date of birth.

b) Attested photocopies of Marks Sheets of qualifying degree examination.

c) Attested photocopies of qualifying Degree certificate (Graduation/Master, B.Tech & M.Tech.)

d) Attested photo copy of SC/ST, BC, SBC, EBC,PH Certificate (if applicable).

e)  No Objection Certificate

f) Character Certificate from Head of Institution last attended.

g) Medical Fitness Certificate from a Govt. Medical Officer.

i) Exp. Certificate (only post qualification experience will be considered.)
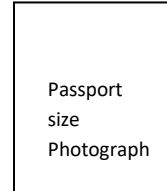
j) Copy of publication in referred Journal (if any)

**YMCA University of Science And Technology**
**Faridabad-121006**
**Roll no Slip Ph.D Admission - 2016**

**Name of the candidate**

**Fathers Name**

**Roll No.**

| |
|---|
| Passport size Photograph |

**Exam Centre: YMCA University of Science and Technology**

**Signature of the Candidate**                      **Signature of the Invigilator**

**This is a provisional roll number slip subjected to the condition that documents will be verified at the time of admission**