

# **Career Guidance, Internship, Training and Placement Manual for Engineering Students**



**Prof. Dr. B. E. Kushare**

Certified Energy Auditor and Power Quality Consultant,  
Professor and Head of Department,  
Department of Electrical Engineering,  
K. K. Wagh Institute of Engineering Education and Research, Amrutdham,  
Panchavati, Nashik – 422003

## Preface

It gives me immense pleasure in presenting the second edition of the document on career guidance and training and placement Manual for engineering students. One of the key parameters considered by students, parents while a selection of a college for an engineering program is the placement track record of the institute. Many times more efforts are taken to invite more industries for placement. Despite many industries participating in campus recruitment percent placement is observed low. There are many reasons for low placement. Training of students right from the second year based on their career development options is one of the areas where the institute, department needs to put more effort. This document presents various opportunities for graduate engineers. Details of entrance examinations for M.E. / M. Tech., MBA, UPSC, MPSC, GRE, GMAT, etc., scholarships for higher studies and their eligibility criteria, opportunities in software, and core industries are presented in this document in precise form. Due to inadequate information on various examinations, many times there is confusion in choosing proper career options after graduation. In this, a list of various organizations/ institutes/ universities providing higher studies and guidance regarding entrance examinations in India and overseas is documented. In today's context employability of Engineering Students after completion of engineering is a concern to everyone. To increase the employability of engineering students it is necessary to provide counseling on opportunities for graduate Engineering students right from the second-year level. Based on the student's interest, strength, weakness training needs of students needs to be identified and training sessions on various identified areas should be organized. After training sessions, it is necessary to focus on Enforcement sessions for three years after the first year. Training engineering students based on their area of interest will be an important step to increase the employability of Engineering Graduate students. The first part of the manual covers various opportunities for young Engineering graduates after completion of Engineering and the second part of the document covers recommendations on the structure of training and placement cell with a detailed procedure to strengthen Training and placement activities.

Compared to the earlier edition the information on various examinations is updated with the change of pattern of curriculum and examination. Also, few new chapters have been added. These include information on online courses, study abroad courses, scholarships, and internships. Suggestions leading to the improvement of the document will be gratefully acknowledged.

This manual is very useful for the students in the second year and third year to choose the right path of the career and also use full for undergraduates to get information on the various examinations and scholarship schemes. I wish to thank Dr. R. K. Munje, Ms. Snehal Sagare and Mrs. Merin John for compiling the information related to all the examinations. Also, I am grateful to all the faculty members of the Department.

**Prof. Dr. B. E. Kushare**

Professor and HOD

Department of Electrical Engineering

August 2021

# Contents

Preface	i
Contents	iii
List of Tables	vii
List of Figures	viii
Vision, Mission, Program Educational Objectives, Program Outcomes, Program Specific Outcomes	1
About Electrical Engineering Department	3
<b>PART I: OPPORTUNITIES FOR YOUNG ENGINEERING GRADUATES</b>	<b>5</b>
Chapter 1	6
<b>GRADUATE APTITUDE TEST IN ENGINEERING (GATE)</b>	<b>6</b>
1.1 Introduction	6
1.2 Eligibility	6
1.3 Examination	6
1.4 Result	6
1.5 Importance of GATE	6
1.6 Qualifying Marks	6
1.7 Changes in GATE Exam in Recent Years	7
Chapter 2	11
<b>Common Admission Test (CAT)</b>	<b>11</b>
2.1 Introduction	11
2.2 Importance of CAT	11
2.3 Test Structure	11
2.4 Eligibility	11
Chapter 3	13
<b>Management Aptitude Test (MAT)</b>	<b>13</b>
3.1 Introduction	13
3.2 Importance of MAT	13
3.3 Test Structure	13
3.4 Eligibility	13
Chapter 4	16
<b>Maharashtra Public Service Commission (MPSC)</b>	<b>16</b>
4.1 Introduction	16

4.2	Eligibility	16
4.3	MPSC Examination (Overview)	16
4.4	Other Examinations of MPSC	17
	Chapter 5	19
	Civil Services Examinations (CSE)	19
5.1	Introduction	19
5.2	Importance of Civil Service	19
5.3	Eligibility	19
5.4	Numbers of Attempts	20
5.5	Test Structure	21
5.6	How to Apply?	21
5.7	Examinations conducted by UPSC	21
	Chapter 6	24
	Graduate Record Examinations (GRE)	24
6.1	Introduction	24
6.2	Importance of GRE	24
6.3	Eligibility	24
6.4	Test Structure	24
6.5	How to Apply?	25
	Chapter 7	26
	Graduate Management Admission Test (GMAT)	25
7.1	Introduction	25
7.2	Format and Timing	25
7.3	Total score	28
7.4	Registration and Preparation	29
	Chapter 8	30
	Test of English as a Foreign Language (TOEFL)	30
8.1	Introduction	30
8.2	Importance of TOEFL	30
8.3	Eligibility	30
8.4	Test Structure	30
8.5	Application Details	31

Chapter 9	32
International English Language Testing System (IELTS)	32
9.1 Introduction	32
9.2 Importance of IELTS	32
9.3 Eligibility	32
9.4 Test Structure	32
9.5 Duration	33
9.6 How to Apply?	33
Chapter 10	
Training and Certification Courses	35
10.1 Introduction	35
Chapter 11	36
Patent Agent Examination	36
11.1 Eligibility	36
11.2 Pattern of Examination and Questions asked in Patent Agent Examination	36
11.3 Examination Date	37
Chapter 12	
Energy Auditor and Energy Manager Examination	38
12.1 Introduction	38
12.2 Eligibility	38
Chapter 13	41
Higher Education in aboard	41
13.1 United States of America	41
13.2 United Kingdom	43
13.3 Singapore	44
13.4 New Zealand	46
13.5 Ireland	47
13.6 Germany	49
13.7 Canada	50
13.8 Australia	51
Chapter 14	54
Scholarships	54
14.1 Introduction	54

14.2	Government Scholarships	54
14.3	Scholarship by Professional Organizations and companies	56
Chapter 15		
Opportunities in IT Industries		60
15.1	Introduction	60
Chapter 16		
Opportunities in Power and Energy Industries		62
16.1	Introduction	62
16.2	Thrust Areas	62
16.3	Employment Opportunities	62
Chapter 17		
Entrepreneurship Development		65
17.1	Introduction	65
17.2	Entrepreneurship Ideas	67
Chapter 18		
Start-ups and Government Schemes		68
18.1	Introduction	68
18.2	Startup India	70
18.3	Make in India	73
18.4	Atal Innovation Mission	73
18.5	Stand-Up India	74
18.6	National Skill Development Mission	74
Chapter 19		
Online Learning Platforms		75
18.1	Introduction	75
18.2	Benefits of Online Teaching and Learning	75
Chapter 20		
Internship		
20.1	Introduction	81
20.2	Why Are Internships Important?	81
20.3	Ways to Find an Internship	82
20.4	Tips for Getting an Internship	83
20.5	Reasons to do an internship	84

20.6	Types of internships for electrical engineering students	84
20.7	List of the best internship sites	86
PART II : RECOMMENDATIONS RELATED WITH TRAINING AND PLACEMENT ACTIVITIES		88
Chapter 1		
Importance of training in career development of Engineering Undergraduate Students		89
1.0	General	89
1.1	Reasons For Poor Placement of Engineering Graduates In Campus, Pull Campus and off Campus, Poor Performance In Competitive Examinations, Higher Studies	89
1.2	Important skills sets required to enhance employability of Engineering Undergraduate students	91
References		93



## **List of Tables**

Table 1.1: List of public sector undertakings recruiting GATE qualified candidates	7
Table 1.2: List of Indian Institute of Technologies	8
Table 1.3: List of National Institute of Technologies in India	9
Table 2.1: List of Indian Institute of Managements	12
Table 3.1: List common national level tests for MBA	14
Table 4.1: Pattern of MPSC examination	16
Table 5.1: Central civil services of Group A	22
Table 5.2: Central civil services of Group B	23
Table 10.1: List of training and certification courses	35
Table 12.1: Paper pattern of Energy Auditor Examination	39
Table 13.1: List of 50 top technological universities in the world	52
Table 15.1: List of IT companies in India and job profile	61
Table 16.1: List of power and energy industries	63
Table 18.1: Online Courses Platform	76
Table 1.1: Learning methods for requirement of Engineering Skill up graduation	92

## **List of Figures**

Figure 11.1 Representation of exam pattern

36

# **Vision, Mission, Program Educational Objectives, Program Outcomes, Program Specific Outcomes**

## **Institute Vision**

Empowering through quality technical education

## **Institute Mission**

Committed to serve the needs of the society at large by imparting state-of-the-art Engineering education and to provide knowledge and develop ATTITUDE, SKILLS, and VALUES, leading to the establishment of quality conscious and sustainable research-oriented Educational Institute.

## **Department Vision**

Development of all-round, socially responsible, innovative electrical professionals and researchers leading to empowerment to serve the needs of society, meet global challenges and emerge as Centre of Excellence.

## **Department Mission**

**M1:** Establish a vibrant learning environment to enable students for lifelong learning with ethical practices to face challenges of the electrical engineering field and globalization by providing state-of-art infrastructural facilities.

**M2:** Promote active learning, critical thinking, and engineering judgment coupled with business, entrepreneurial skills

**M3:** Expose to recent technological advancements and industrial professional practices.

**M4:** Introduce PG Programs and establish a recognized research center.

**M5:** Provide a conducive environment and promote intellectual (scholarly) pursuits for encouraging innovation, research, real-world problems with a multidisciplinary approach.

**M6:** Offer consultancy and R&D services to various social, educational, industrial, and commercial organizations for self-reliance.

**M7:** Establish a center of excellence in the field of power quality and energy management

## **Program Education Objectives**

**PEO1:** To provide a solid foundation in mathematics, science, humanity, environment, and engineering fundamentals.

**PEO2:** To train students with wider electrical engineering concepts to comprehend, simulate, analyze, design, solve, draw inferences, realize and foster creativity, innovation, and research to excel in the technical field.

**PEO3:** To provide a conducive academic environment to inculcate professional skills, ethical practices, and soft skills leading to entrepreneurship development, enhancement of employability, success in competitive examinations, and life-long learning.

**PEO4:** To relate engineering issues to socio-economic context with a multidisciplinary approach to address the problem of the real world.

### **Program Outcomes: Engineering Graduates will be able to:**

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis, and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### **Program Specific Outcomes (PSO)**

#### **Students will be able to:**

**PSO1:** To apply the fundamentals of Electrical Engineering to solve real-time problems with a social and multi-disciplinary approach.

**PSO2:** To model, simulate, analyze, critically evaluate, and interpret the results with acquired professional skills and ethical practices, leading to enhancement of employability.

# About Electrical Engineering Department

## Department History:

Department was established in the year 1996, approved by AICTE, New Delhi, and affiliated to Savitribai Phule Pune University (SPPU), Pune (formerly University of Pune) with a sanctioned intake of 40 for Undergraduate (UG). Later on, intake was increased to 60 in the academic year 1998-99. In the year 2003, the Department of Electrical Engineering was accredited by the National Board of Accreditation (NBA), AICTE, New Delhi for 3 years. To accelerate Research and Development (R&D) activities, the department started a Postgraduate programme in Electrical Engineering with Control System specialization with 18 intake in 2007-08 and a recognized Ph.D. Research Center in the year 2008-09. In the year 2011, the department started a second shift UG programme with an increased strength of 60 students and started a new post-graduate programme in an Electrical Power System with a sanctioned intake of 18. In the year 2011, the UG programme of the Department of Electrical Engineering was again accredited by NBA, AICTE, New Delhi for 3 years. With the constant efforts and thrust for continuous improvement, the department (both the UG shifts) is once again accredited by NBA in 2019 for the next three years.

## About Faculties:

The department has a well-qualified and devoted team of 25 teaching faculty members. The faculty members of the department have presented and published papers in National and International journals, conferences, visited National and International Universities, exhibitions, etc. Faculty members also have received various awards and funds from the many professional societies and funding agencies. Four faculty members of the departments are currently pursuing Ph.D. in various areas in Electrical Engineering. Faculty members attend Continuing Education Programs, online courses regularly to keep them updated with changing technology in the respective electrical engineering fields. Faculty members are also on the governing body of the professional society and members of professional societies.

## Various Events:

Department is very proactive in organizing workshops, seminars, conferences, webinars, STTP, and FDP funded by various funding agencies as well as self-supported in the area of power quality, energy management and audit, condition monitoring of electrical equipment, recent trends in switch gear, MATLAB, ETAP, PSCAD, Robotics, Emerging Trends in Smart Grid and software training every year. One of the mega-events organized by the department is the National Level Working Model Contest and Project Exhibition 'IET-KARMVEER EXPO', supported by the Institution of Engineering and Technology (UK). Around 500 to 600 students participate every year in this event.

## About Students:

The students of the department have also presented papers, participated in various National level events, and won prizes. The academic results at various university examinations are

excellent. Many students of the second year, third year, final year topped the university examination with ranks 1 to 11. In the last three years, there are around 11 University rank holders. The Department has the IET (UK) Young Member Section (IET On-Campus), IEEE student chapter, and a student body 'EFFECT' through which various events are conducted for all-round development of students. These events include expert lectures, workshops, technical tours, industrial visits, Soft Skill workshops, poster and mini-project competitions, school seminars, etc. Many multinational companies come to conduct campus placement interviews and around 60 to 80% of the students get campus placements. The number of students going for higher studies is also significant.

### **Testing and Consultancy:**

Department of Electrical Engineering offers testing, consultancy, and training services in the areas of electrical design, power quality, condition monitoring, energy management, and audit to many National and Multinational industrial organizations, such as Enercon India Pvt. Ltd., Enercon GmbH Germany, IIT Powai, Bosch Ltd. Nashik, Mahindra & Mahindra Ltd. Nashik, Crompton Greaves Nashik, Crompton Greaves Mumbai, Glaxo SmithKline Nashik Innova rubbers Nashik, Blue Cross Nashik, Samsonite Asia Ltd. Nashik, TKES, Gonde, Anil printers Gonde, Renfro India Gonde, TBI khardi, Kalyani Lemmorz Ltd. Chakan, SAF Yeast Ltd. Chiplum, SAF Yeast Sandia, and many others. The major kits and equipment available for consultancy services are the HIOKI 3198 power quality analyzer, IR Imager, combustion analyzer, flue gas analyzer, breaker timing kit, relay testing kit, and many other types of equipment.

### **Research and Development:**

Department has completed two MODROBs and several minor research projects, funded by AICTE, University Grant Commission, SERC Fellowship of Department of Science and Technology, BCUD Pune. Faculty members also work on industry projects and help to solve their problems. Department is equipped with state-of-the-art equipment and Laboratories with excellent computational facilities including professional software packages, such as ETAP, PSCAD, LABVIEW, MATLAB, ANSYS, DigSILENT POWER FACTORY. In all the conducive environment exists in the department for both faculties and students.

Department of Electrical Engineering aims to establish a center of excellence in various areas of electrical engineering such as power quality, energy management, audit, conditioning monitoring and to offer value-added services to industries as well as society.

**PART I: OPPORTUNITIES FOR YOUNG ENGINEERING  
GRADUATES**

# **Chapter 1**

## **GRADUATE APTITUDE TEST IN ENGINEERING (GATE)**

### **1.1 Introduction**

The Graduate Aptitude Test in Engineering (GATE) is an all-India examination that primarily tests the comprehensive understanding of various undergraduate subjects in Engineering and Technology. GATE is conducted jointly by the Indian Institute of Sciences and IIT's on behalf of the National Coordination Board – GATE, Department of Higher Education, Ministry of Human Resource Development (MHRD), and Government of India. The GATE Score of a candidate reflects the relative performance level of a candidate. The score is used for admissions to various post-graduate programs (e.g. M.E., M.Tech, direct Ph.D., and recruitment in government organizations) in Indian higher education institutes with financial assistance provided by MHRD and other Government agencies. The score may also be used by Public Sector Units (PSU) for employment screening purposes.

### **1.2 Eligibility**

The following categories of candidates are eligible to appear in GATE 2022:  
B.E./B.Tech/ B.Arch/ B.Pharm /B.S M.Sc. /M.A. / MCA / M.E./M.Tech

### **1.3 Examination**

The examination is of a three-hour duration with patterns and syllabus varying from paper to paper. The exam is conducted in online mode.

### **1.4 Result**

GATE Results are usually declared a little over one month after the exam. The candidate may view total marks scored, GATE Score, All India Rank, and the cut-off marks for various categories in the candidate's paper. GATE Score is valid for THREE YEARS from the date of the announcement of the results. GATE Scorecard is issued to all qualified candidates.

### **1.5 Importance of GATE**

Several Public Sector Undertakings (PSUs) have started recruiting with GATE Scores for their Management Trainee posts. Few such organizations are listed in Table 1.1 with the eligibility criterion and number of seats available.

### **1.6 Qualifying Marks**

The rules for qualifying scores have varied from year to year. In general, the qualifying score is the average of marks scored by all individual candidates with negative marks counted as zero. If this average is less than 25, then 25 is considered the qualifying mark. The list of IITs and NIT's, offering admissions to postgraduate courses, are given in Tables 1.2 and 1.3 respectively.



### 1.7 Changes in GATE Exam in Recent Years

- **Gate 2019:** Only final year students and pass out students were eligible to write GATE exam. The application process was made completely online, candidates could view their responses of the ORS and also GATE Office released official solutions for GATE papers.
- **Gate 2020:** Candidates are required to upload a scanned copy of Photograph and Signature, certificate of qualifying degree, category certificate (SC/ST/PWD), and/ or Dyslexia certificate, wherever applicable. The Application fee was increased from 1,000 to 1,200.
- **Gate 2021:** Mode: The exam will be conducted in online (CBT) mode. No of Subject Papers: The exam will be conducted for 27 subject papers Two new subject papers – Environmental Science & Engineering (ES) and Humanities & Social Sciences (XS) have been added this year GATE -2021.
- **Gate 2022:**
  - Eligibility criteria to appear for GATE-2022 is relaxed from the minimum 10+2+4 (ongoing) to a minimum of 10+2+3 (ongoing), enabling even those in the third year of their undergraduate studies to appear for the examination, thus providing an additional opportunity to candidates to improve their performance to secure better career options.
  - Students applying for GATE 2022 can also opt for two different papers from the prescribed set of combinations.

**Table 1.1: List of public sector undertakings recruiting GATE qualified candidates**

Name of	No of Seats	Eligibility	Streams Applicable
Power Grid	50	GATE 2022	EE, EC, CE, Power system engineering,
IOCL	NA	GATE 2022	CE, CH,, EE, IN, ME
MECL	NA	GATE 2022	Chemistry
DDA	NA	GATE 2022	CE, EE, ME
GAIL	25	GATE 2022	Petrochemical, EE, CE, IN
BPCL	NA	GATE 2022	ME
BHEL	NA	GATE 2022	ME, EE, EC
NTPC	NA	GATE 2022	EE, ME, CE, IN, EC
HPCL	NA	GATE 2022	ME, CE, EE, EC, IN
NALCO	120	GATE 2022	ME, EE, IN, CE, CH, EC, Metallurgy, Mining Geology
BIS	150	GATE 2022	ME, EE, CE, CH, Metallurgy, Bio-Technology, Petro-Chemical Engineering, Bio-medical Engineering
NPCIL	200	GATE 2022	ME, EE, IN, EC, CE
HURL	80	GATE 2022	CE, EE, ME, IN
ECIL	64	GATE 2022	ME, EE, IN, CE, CH, EC

DRDO	NA	GATE 2022	EC, CS & Engg, ME, Physics, Chemistry, Geology, Aerospace Engg, Mathematics, CH
THDC	NA	GATE 2022	ME & AE/ EE (Power)/ EE(Power System) & HV.CE

**Table 1.2: List of Indian Institute of Technologies**

Name	Established	City/Town	State/UT	Website
IIT Bhubaneswar	2008	Bhubaneswar	Odisha	<a href="http://www.iitbbs.ac.in">www.iitbbs.ac.in</a>
IIT Bombay	1958	Mumbai	Maharashtra	<a href="http://www.iitb.ac.in">www.iitb.ac.in</a>
IIT Bhilai	2016	Bhilai	Chhattisgarh	<a href="http://www.iitbhilai.ac.in">www.iitbhilai.ac.in</a>
IIT Delhi	1963	New Delhi	Delhi	<a href="http://www.iitd.ac.in">www.iitd.ac.in</a>
IIT Dhanbad	2016	Dhanbad	Jharkhand	<a href="http://www.iitism.ac.in">www.iitism.ac.in</a>
IIT Dharwad	2016	Dharwad	Karnataka	<a href="http://www.iitdh.ac.in">www.iitdh.ac.in</a>
IIT Gandhinagar	2008	Gandhinagar	Gujarat	<a href="http://www.iitgn.ac.in">www.iitgn.ac.in</a>
IIT Goa	2016	Goa	Goa	<a href="http://www.iitgoa.ac.in">www.iitgoa.ac.in</a>
IIT Guwahati	1994	Guwahati	Assam	<a href="http://www.iitg.ac.in">www.iitg.ac.in</a>
IIT Hyderabad	2008	Hyderabad	Andhra Pradesh	<a href="http://www.iith.ac.in">www.iith.ac.in</a>
IIT Indore	2009	Indore	Madhya Pradesh	<a href="http://www.iiti.ac.in">www.iiti.ac.in</a>
IIT Jodhpur	2008	Jodhpur	Rajasthan	<a href="http://www.iitj.ac.in">www.iitj.ac.in</a>
IIT Jammu	2016	Jammu	Jammu and Kashmir	<a href="http://www.iitjammu.ac.in">www.iitjammu.ac.in</a>
IIT Kanpur	1959	Kanpur	Uttar Pradesh	<a href="http://www.iitk.ac.in">www.iitk.ac.in</a>
IIT Kharagpur	1951	Kharagpur	West Bengal	<a href="http://www.iitkgp.ac.in">www.iitkgp.ac.in</a>
IIT Madras	1959	Chennai	Tamil Nadu	<a href="http://www.iitm.ac.in">www.iitm.ac.in</a>
IIT Mandi	2009	Mandi	Himachal Pradesh	<a href="http://www.iitmandi.ac.in">www.iitmandi.ac.in</a>
IIT Patna	2008	Patna	Bihar	<a href="http://www.iitp.ac.in">www.iitp.ac.in</a>
IIT Palakkad	2015	Kozhippara	Kerala	<a href="http://www.iitpkd.ac.in">www.iitpkd.ac.in</a>

IIT Roorkee	2001( founded in 1847)	Roorkee	Uttarakhand	<a href="http://www.iitr.ac.in">www.iitr.ac.in</a>
IIT Ropar	2008	Rupnagar	Punjab	<a href="http://www.iitrpr.ac.in">www.iitrpr.ac.in</a>
IIT Tirupati	2015	Tirupati	Andhra Pradesh	<a href="http://www.iittp.ac.in">www.iittp.ac.in</a>
IIT (BHU) Varanasi	2012 ( founded in 1919)	Varanasi	Uttar Pradesh	<a href="http://www.iitbhu.ac.in">www.iitbhu.ac.in</a>

**Table 1.3: List of National Institute of Technologies in India**

Name	Established	Location	State/UT	Website
NIT Agartala	1965 (2006)	Agartala	Tripura	<a href="http://www.nita.ac.in">www.nita.ac.in</a>
Motilal Nehru National Institute of Technology	1961 (2002)	Allahabad	Uttar Pradesh	<a href="http://www.mnit.ac.in">www.mnit.ac.in</a>
NIT Arunachal	2010	Yupia	Arunachal	<a href="http://www.nitap.ac.in">www.nitap.ac.in</a>
Maulana Azad National Institute of	1960 (2002)	Bhopal	Madhya Pradesh	<a href="http://www.manit.ac.in">www.manit.ac.in</a>
National Institute of Technology Calicut	1961 (2002)	Kozhikode	Kerala	<a href="http://www.nitc.ac.in">www.nitc.ac.in</a>
			Lakshadweep	
NIT Delhi	2010	New Delhi	Chandigarh	<a href="http://www.nitdelhi.ac.in">www.nitdelhi.ac.in</a>
NIT Durgapur	1960 (2003)	Durgapur	West Bengal	<a href="http://www.nitdgp.ac.in">www.nitdgp.ac.in</a>
NIT Goa	2010	Farmagudi	Goa	<a href="http://www.nitgoa.ac.in">www.nitgoa.ac.in</a>
NIT Puducherry	2010	Karaikal	Pondicherry	<a href="http://www.nitpy.ac.in">www.nitpy.ac.in</a>
NIT Hamirpur	1986	Hamirpur	Himachal	<a href="http://www.nith.ac.in">www.nith.ac.in</a>
Malaviya National Institute of Technology	1963 (2002)	Jaipur	Rajasthan	<a href="http://www.mnit.ac.in">www.mnit.ac.in</a>
NIT Manipur	2010	Imphal	Manipur	<a href="http://www.nitmanipur.ac.in">www.nitmanipur.ac.in</a>
NIT Meghalaya	2010	Shillong	Meghalaya	<a href="http://www.nitm.ac.in">www.nitm.ac.in</a>
NIT Mizoram	2010	Aizawl	Mizoram	<a href="http://www.nitmz.ac.in">www.nitmz.ac.in</a>
NIT Nagaland	2010	Dimapur	Nagaland	<a href="http://www.nitnagaland.ac.in">www.nitnagaland.ac.in</a>
Dr. B. R. Ambedkar National Institute of	1987 (2002)	Jalandhar	Punjab	<a href="http://www.nitj.ac.in">www.nitj.ac.in</a>
NIT Jamshedpur	1960	Jamshedpur	Jharkhand	<a href="http://www.nitjsr.ac.in">www.nitjsr.ac.in</a>
NIT Kurukshetra	1963 (2002)	Kurukshetra	Haryana	<a href="http://www.nitkkr.ac.in">www.nitkkr.ac.in</a>

Visvesvaraya National Institute of	1960 (2002)	Nagpur	Maharashtra	<a href="http://www.vnit.ac.in">www.vnit.ac.in</a>
NIT Patna	1886 (2004)	Patna	Bihar	<a href="http://www.nitp.ac.in">www.nitp.ac.in</a>
NIT Raipur	1956 (2005)	Raipur	Chhattisgarh	<a href="http://www.nitr.ac.in">www.nitr.ac.in</a>
NIT Rourkela	1961 (2002)	Rourkela	Odisha	<a href="http://www.nitrkl.ac.in">www.nitrkl.ac.in</a>
NIT Sikkim	2010	Ravangla	Sikkim	<a href="http://www.nitsikkim.ac.in">www.nitsikkim.ac.in</a>
NIT Silchar	1967 (2002)	Silchar	Assam	<a href="http://www.nits.ac.in">www.nits.ac.in</a>
NIT Srinagar	1960 (2003)	Srinagar	Jammu &	<a href="http://www.nitsri.net">www.nitsri.net</a>
S V National Institute of	1961 (2003)	Surat	Gujarat	<a href="http://www.svnit.ac.in">www.svnit.ac.in</a>
NIT Karnataka	1958 (2002)	Surathkal	Karnataka	<a href="http://www.nitk.ac.in">www.nitk.ac.in</a>
NIT Tiruchirappalli	1964 (2003)	Tiruchirappalli	Tamil Nadu	<a href="http://www.nitt.edu">www.nitt.edu</a>
NIT Uttarakhand	2010	Srinagar, Uttarakhand/	Uttarakhand	<a href="http://www.nituk.com">www.nituk.com</a>
NIT Warangal	1958 (2002)	Warangal	Andhra Pradesh	<a href="http://www.nitw.ac.in">www.nitw.ac.in</a>
NIT Andhra Pradesh (NITANP)	2015	Tadepalligudem	Andhra Pradesh	<a href="http://www.nitandra.ac.in">www.nitandra.ac.in</a>

## **Chapter 2**

### **Common Admission Test (CAT)**

#### **2.1 Introduction**

CAT is an all-India test conducted by the Indian Institutes of Management (IIMs) as an entrance exam for the management programs of its 13 business schools and Top MBA Schools. Other than IIMs, CAT scores are also accepted by many other MBA Institutes across India. The CAT is one of the world's most demanding entrance examinations for any graduate institute. The candidate is expected to excel in arithmetical problem solving, geometry, statistics, and data interpretation, logical reasoning in solving complex puzzles, and English language skills.

#### **2.2 Importance of CAT**

CAT, is a key for admission in 20 IIMs and top B-schools in India. Performance in the CAT examination is an important component in the admission process. Apart from that many other colleges accept the CAT scores and give it a strong emphasis apart from other educational qualifications. So if you have a dream to study in one of the best MBA colleges in India you have to appear for CAT. With so many new sectors opening up, retail, insurance, BPO, telecom it would seem the job pie has grown exponentially. Better salary, designation, and job profiles are offered to the MBA's. A list of 20 IIMs is given in Table 2.1.

#### **2.3 Test Structure**

CAT is a computer-based test since 2009. The processes include (1) Written Ability Test (WAT), (2) Group Discussions (GD), and (3) Personal Interviews (PI).

IIMs may use previous academic performance of the candidates, relevant work experience, and other similar inputs in short listing and ranking of candidates at various stages of the admission process. The processes, academic cut-offs, and the weights allocated to the evaluation parameters may vary across IIMs. For more information, you may refer to the admissions policies of IIMs from their respective websites. The timing allotted to solve the questions always varies.

#### **2.4 Eligibility**

The candidate must hold a Bachelor's Degree, with at least 50 percent marks or equivalent CGPA 45 % in case of the candidates belonging to Scheduled Caste (SC) and Scheduled Tribe (ST) categories, from a recognized University. Candidates who are currently in their final year of Bachelor's degree (or its equivalent) can also apply, provided they expect to complete all their exams and other requirements for obtaining the qualifying degree. Such candidates, if selected for admission, will have to submit a certificate at the time of registration, stating that the candidate has completed all the requirements for obtaining the Bachelor's degree. This certificate has to be obtained from the HOD/ Registrar / Principal of the institution where the candidate is studying. Also, such candidates must produce the final year mark sheet and the degree certificate as proof of having satisfied the minimum eligibility requirements, by the dates specified by the respective IIMs in the CAT Bulletin.

**Table 2.1: List of Indian Institute of Management**

Management Institute	Established	Location	Website
Indian Institute of Management Calcutta	1961	Kolkata, West Bengal	<a href="http://www.iimcal.ac.in">www.iimcal.ac.in</a>
Indian Institute of Management Ahmedabad	1961	Ahmedabad, Gujarat	<a href="http://www.iimahd.ernet.in">www.iimahd.ernet.in</a>
Indian Institute of Management Bangalore	1973	Bangalore, Karnataka	<a href="http://www.iimb.ernet.in">www.iimb.ernet.in</a>
Indian Institute of Management Lucknow	1984	Lucknow, Uttar Pradesh	<a href="http://www.iiml.ac.in">www.iiml.ac.in</a>
Indian Institute of Management Kozhikode	1996	Kozhikode, Kerala	<a href="http://www.iimk.ac.in">www.iimk.ac.in</a>
Indian Institute of Management Indore	1996	Indore, Madhya Pradesh	<a href="http://www.iimidr.ac.in">www.iimidr.ac.in</a>
Indian Institute of Management Shillong	2007	Shillong, Meghalaya	<a href="http://www.iimshillong.in">www.iimshillong.in</a>
Indian Institute of Management Rohtak	2010	Rohtak, Haryana	<a href="http://www.iimrohtak.ac.in">www.iimrohtak.ac.in</a>
Indian Institute of Management Ranchi	2010	Ranchi, Jharkhand	<a href="http://www.iimranchi.ac.in">www.iimranchi.ac.in</a>
Indian Institute of Management Raipur	2010	Raipur, Chhattisgarh	<a href="http://www.iimraipur.ac.in">www.iimraipur.ac.in</a>
Indian Institute of Management Tiruchirappalli	2011	Tiruchirappalli, Tamil Nadu	<a href="http://www.iimtrichy.ac.in">www.iimtrichy.ac.in</a>
Indian Institute of Management Udaipur	2011	Udaipur, Rajasthan	<a href="http://www.iimu.ac.in">www.iimu.ac.in</a>
Indian Institute of Management Kashipur	2011	Kashipur, Uttarakhand	<a href="http://www.iimkashipur.ac.in">www.iimkashipur.ac.in</a>
Indian Institute of Management Amritsar	2015	Amritsar, Panjab	<a href="http://www.iitamritsar.ac.in">www.iitamritsar.ac.in</a>
Indian Institute of Management Nagpur	2015	Nagpur Maharashtra	<a href="http://www.iimnagpur.ac.in">www.iimnagpur.ac.in</a>
Indian Institute of Management Sambalpur	2015	Kumelsingha, Odisha	<a href="http://www.iimsambalpur.ac.in">www.iimsambalpur.ac.in</a>
Indian Institute of Management Vishakhapatnam	2015	Visakhapatnam, Andhra Pradesh	<a href="http://www.iimv.ac.in">www.iimv.ac.in</a>
Indian Institute of Management Sirmaur	2015	Kunja, Himachal Pradesh	<a href="http://www.iimsirmaur.ac.in">www.iimsirmaur.ac.in</a>
Indian Institute of Management Bodhgaya	2015	Turi Khurd, Bihar	<a href="http://www.iimbg.ac.in">www.iimbg.ac.in</a>
Indian Institute of Management Jammu	2016	Jammu	<a href="http://www.iimj.ac.in">www.iimj.ac.in</a>

## **Chapter 3**

### **Management Aptitude Test (MAT)**

#### **3.1 Introduction**

Management Aptitude Test (MAT) is an entrance test for those who want to pursue a career in management. All India Management Aptitude Testing Service (AIMATS), New Delhi conducts the National Entrance Test for admission to MBA and equivalent programs of the various participating institutes. MAT results are accepted by the All India Management Association - Centre for Management Education (AIMA-CME) and other AICTE-approved Management Institutes (MI) and university departments.

#### **3.2 Importance of MAT**

If you are planning to pursue MBA from a mid-tier college which will save your money as well as your effort of competing for tier 1 colleges then MAT could be a good option for you. Moreover if you pass out from a mid-tier MBA college with sound practical knowledge the chances for you ending up in a decent paying job are still high. Though not particularly but many good corporate prefer to hire from mid-tier colleges due to various reasons. So don't worry even if you were not successful in taking admission to top-notch colleges. All you have to do is to work hard and acquire more and more practical knowledge and more increase your networking.

#### **3.3 Test Structure**

Candidates can choose any one of the two options to take the test (1) Paper Based Test (PBT) and (2) Computer Based Test (CBT). It is an objective-type test with multiple choice answers. The test judges the following areas

- Language Comprehension
- Mathematical Skills
- Data Analysis and Sufficiency
- Intelligence and Critical Reasoning
- Indian and Global Environment

Though General Knowledge marks are not included for score calculation it is recommended that students attempt this section and not leave it.

#### **3.4 Eligibility**

The candidate must hold a Bachelor's Degree, with at least 50 percent marks or equivalent. The minimum qualification for appearing in MAT is graduation in any discipline from any recognized University or equivalent recognized degree. A final year student in any undergraduate can also appear provisionally. Usually, there is a minimum percentage requirement in graduation, which is different for different Management Institutes/universities. For this refer to the prospectus of the particular MIs/University. Admission criteria for every institute are different. All MIs participating in MAT are either AICTE approved; University affiliated College, University Department. For further information, you may contact the MIs/Universities of your choice. The list of various

MIs/Universities is available in the MAT bulletin along with the admission notification. It may be worthwhile to go through the brochure of the MIs for detailed information.

Today, many top-notch B-Schools in India offer specialization in different disciplines of business management. The Top 50 B-Schools in India not only offer superlative education and learning but also attract recruiters offering the best packages in India. The top B-Schools either affiliate themselves to a common national level entrance test or take their aptitude test to select candidates. Various common national-level tests to get into the finest B-Schools of India are given in Table 3.1.

**Table 3.1: List common national level tests for MBA**

Sr. No.	Entrance Exam	Institute	Eligibility	Tentative Month	Website
1	CAT	Indian Institute of Management	50% in Graduation	November	<a href="http://www.catiim.in">www.catiim.in</a>
2	IRMA	Institute of Rural Management Anand	50% in Graduation	February	<a href="http://www.irma.ac.in">www.irma.ac.in</a>
3	IIFT	Indian Institute of Foreign Trade	50% in Graduation	January	<a href="http://www.iift.edu">www.iift.edu</a>
4	MAT	All India Management Association	Graduation in any Discipline	September, December, February & May	<a href="http://www.aima.in">www.aima.in</a>
5	SNAP	Symbiosis International University	50% in Graduation(regular degree)	December	<a href="http://www.snaptest.org">www.snaptest.org</a>
6	IBSAT	ICFAI	50% in Graduation	December	<a href="http://www.ibsat.org">www.ibsat.org</a>
7	NMAT	NMIMS	50% in Graduation	November	<a href="http://www.nmims.edu">www.nmims.edu</a>
8	XAT	XLRI, Jamshedpur	50% in Graduation	January	<a href="http://www.xlri.ac.in">www.xlri.ac.in</a>
9	TISS	Tata Institute of Social Sciences	Graduation in any Discipline	February	<a href="http://www.tiss.edu">www.tiss.edu</a>
10	ATMA	Association of Indian Management Studies	50% in Graduation	February	<a href="http://www.atmaaims.com">www.atmaaims.com</a>
11	CMAT	AICTE	50% in Graduation	February	<a href="http://www.aicte-cmat">www.aicte-cmat</a>
12	MH-CET	Directorate of Technical Education, Maharashtra State	45% in Graduation in any discipline	July	<a href="http://www.dte.org.in">www.dte.org.in</a>
13	CUSAT	Cochin University of Science and Technology	Graduation in any Discipline	April	<a href="http://www.cusat.nic.in">www.cusat.nic.in</a>
14	PAM-CAT	GNDU, Amritsar / PTU, Jalandhar / Punjabi University, Patiala	Graduation in any Discipline	June/July	<a href="http://www.gndu.ac.in">www.gndu.ac.in</a> <a href="http://www.punjabiun">www.punjabiun</a> <a href="http://www.ptu.ac.in">www.ptu.ac.in</a>



15	MET-MP	MADHYA PRADESH PROFESSIONAL EXAMINATION BOARD	50% in Graduation	April/June	<a href="http://www.vyapam.nic.in">www.vyapam.nic.in</a>
16	TANCET	Anna University, Chennai	Graduation in any Discipline	March	<a href="http://www.annauniv.edu">www.annauniv.edu</a>
17	OCET	Punjab University, Chandigarh	Different Eligibility for Different course	June	<a href="http://www.puchd.ac.in">www.puchd.ac.in</a>
18	UP-SEE	UP Technical University	45% in Graduation in any discipline	June	<a href="http://www.uptu.nic.in">www.uptu.nic.in</a>
19	Orissa JEE	Orissa JEE	Graduation in any Discipline	May	<a href="http://www.jeeorissa.in">www.jeeorissa.in</a>
20	GCET	Gujarat Secondary and Higher Secondary Education Board	50% in Graduation	November	<a href="http://www.gtu.ac.in">www.gtu.ac.in</a>
21	KMAT	KARNATAKA PRIVATE POST-GRADUATE COLLEGES' ASSOCIATION	Graduation in any Discipline	July	<a href="http://www.kmat-2020">www.kmat-2020</a>
22	RMAT	Rajasthan Technical University	50% in Graduation	June	<a href="http://www.rtu.ac.in/rm">www.rtu.ac.in/rm</a>
23	UPMCAT	Uttar Pradesh Technical University	Graduation in any Discipline	May	<a href="http://www.uptu.ac.in">www.uptu.ac.in</a>

## Chapter 4

### Maharashtra Public Service Commission (MPSC)

#### 4.1 Introduction

The Maharashtra Public Service Commission (MPSC) is a body created by the Constitution to select applicants for civil service jobs in the Indian state of Maharashtra according to the merits of the applicants and the rules of reservation.

The Head Office of the MPSC is located at the Maharashtra State Capital Mumbai. Maharashtra Public Service Commission (MPSC) is a Constitutional Body established Under Article 315 of Constitution of India which provides smooth and efficient functioning of the Government of Maharashtra by providing suitable candidates for various Government posts and advise them on various service matters like formulation of Recruitment Rules, advice on promotions, transfers, and disciplinary actions, etc.

#### 4.2 Eligibility

##### 4.2.1 Educational Qualification

Bachelor's degree in any faculty of a recognized university.

##### 4.2.2 Age limit

- 19 to 33 years - Open Category
- Five years relaxation for SC/ST, Players (Winners of Awards)
- Five years limitation for Ex-servicemen Army, Short service Commission
- Age limit for disabled persons: 45.

#### 4.3 MPSC Examination (Overview)

This Examination recruits candidates for the post of Deputy Collector, Deputy Superintendent of Police, Sales Tax Officer, and other Class I and II Officers There are Three Stages: 1) Preliminary Examination 2) Main Examination 3) Interview

##### 4.3.1 Preliminary Examination

**Table 4.1 Pattern of MPSC examination**

Paper No.	Marks	Duration	Standard	Medium	Nature of Paper
Paper I (compulsory)	200	Two hours	Degree	Marathi & English	Objective Type
Paper II (compulsory)	200	Two hours	Topic No.(1) to (5) Degree level Topic No.(6) class X level Topic No.(7) X / XII level		

##### **Paper I - (200 marks)**

- Current events of state, national, and international importance.

- History of India (with special reference to Maharashtra) and Indian National Movement.
- Maharashtra, India and World Geography - Physical, Social, Economic Geography of Maharashtra, India and the World.
- Maharashtra and India - Polity and Governance - Constitution, Political System, Panchayati Raj, Urban Governance, Public Policy, Rights Issues, etc.
- Economic and Social Development - Sustainable Development, Poverty, Inclusion, Demographics, Social Sector initiatives, etc.
- General issues on Environmental Ecology, Bio-diversity, and Climate Change - that do not require subject specialization.
- General Science.

**Paper-II - (200 marks)**

- Comprehension
- Interpersonal skills including communication skills.
- Logical reasoning and analytical ability.
- Decision-making and problem-solving.
- General mental ability.
- Basic numeracy (numbers and their relations, orders of magnitude, etc.) (Class X level), Data interpretation (charts, graphs, tables, data sufficiency, etc.- Class X level) ➤ Marathi and English Language Comprehension skills (Class X/XII level).

**Note 1:** Questions relating to Marathi and English Language Comprehension skill of Class X/XII level (last item in the Syllabus of Paper-II) will be tested through passages from Marathi and English language without providing cross translation thereof in the question paper.

**Note 2:** The questions will be of multiple choices, objective type.

**Note 3:** The candidate must appear in both the Papers of State Services (Prelim) Examination for evaluation. Therefore a candidate will be disqualified in case he/she does not appear in both the papers of State Services (Prelim) Examination.

**4.3.2 Main Examination - There shall be six compulsory papers.**

Two in Languages - English and Marathi, 100 Marks Each, Descriptive type questions.

Four papers of General Studies 150 Marks Each, Multiple Choice Questions with 3:1

Negative Marking, Objective type questions General Studies

- Paper I: History & Geography (about Maharashtra)
- Paper-II: Indian constitution & Law, Politics (concerning Maharashtra)
- Paper III: Human Resource Development and Human Rights
- Paper IV: Economy & Planning, Economics of development & Agriculture, Science & technology development

Passing Marks 45% in each of the 6 papers for the open Category. 40% in each of 6 papers for reserved category SC, ST, OBCs, etc.

**4.3.3 Interview: Total Marks- 100. Duration- 30 to 45min.**

**4.4 Other Examinations of MPSC**

- Maharashtra State Engineering Services Examination Gr A & Gr B
- Maharashtra State Forest Service Examination
- Maharashtra Agricultural Services Examination ➤ Police Sub Inspector Examination
- Assistant Motor Vehicle Inspector Examination
- Sales Tax Inspector Competitive Examination
- Assistant at Mantralaya Examination
- Civil Judge (Junior Division), Judicial Magistrate (First Class), Competitive Examination
- Clerk typist Examination

# Chapter 5

## Civil Services Examinations (CSE)

### 5.1 Introduction

The Civil Services Examination (CSE) is a nationwide competitive examination in India conducted by the Union Public Service Commission (UPSC) for recruitment to the various Civil Services of the Government of India, including Indian Administrative Service (IAS), Indian Foreign Service (IFS), Indian Police Service (IPS) and Indian Revenue Service (IRS) among others.

### 5.2 Importance of Civil Service

Those who have a passion to serve the nation directly with administrative power opt to go for the civil services exam. Despite the selection process being very tough and the rate of success very low the charm and significance of this exam don't seem to fall. So if you want to bring a new wave of change in India Civil services are the way. The administrative services give an immediate sense of participating in Indian governance.

### 5.3 Eligibility

The eligibility norms for the examination are as follows:

#### 5.3.1 Nationality

- (a) For the Indian Administrative Service and the Indian Police Service, a candidate must be a citizen of India.
- (b) For the Indian Foreign Service, a candidate must be either (1) A citizen of India or (2) A person of Indian origin who has migrated from Pakistan, Myanmar, Sri Lanka, Kenya, Uganda, Tanzania, Zambia, Malawi, Zaire, Ethiopia or Vietnam to permanently settle in India
- (c) For other services, a candidate must be either a citizen of Nepal or Bhutan

#### 5.3.2 Education

All candidates must have a minimum of any of the following educational qualifications:

- A degree from a Central, State or Deemed university
- A degree received through Correspondence Education or Distance Education
- A degree from an Open University
- A qualification recognized by the Government of India as being equivalent to either of the above

The following candidates are also eligible but have to submit proof of their eligibility from a competent authority at their institute/university at the time of the main examination, failing which they will not be allowed to attend the exam.

- Candidates who have appeared in an examination, the passing of which would render them educationally qualified enough to satisfy any of the above points
- Candidates who have passed the final exam of the MBBS degree but have not yet completed their internship

### 5.3.3 Age

Prescribed age limits are a minimum of 21 years and a maximum of 32 years as of 1 August of the year of Examination. A candidate who turns 21 on 1 August is eligible whereas a candidate who turns 33 is not. Upper age limit relaxation is provided to candidates as follows: ➤ A maximum of three years for OBC candidates

- A maximum of three years in case of Defence Services personnel disabled in operations during hostilities with any foreign country or in a disturbed area and released as a consequence thereof.
- A maximum of five years for candidates belonging to a Scheduled Caste or a Scheduled Tribe
- A maximum of five years if a candidate had ordinarily been domiciled in the State of Jammu & Kashmir during the period from 1 January 1980 to 31 December 1989.
- A maximum of five years in case of ex-servicemen including Commissioned Officers and ECOs/SSCOs who have rendered at least five years Military Service as on 1 August and have been released on either of the following basis:
  - (a) On completion of assignment (including those whose assignment is due to be completed within one year from 1 August) otherwise than by way of dismissal or discharge on account of misconduct or inefficiency
  - (b) On account of physical disability attributable to Military Service
- A maximum of five years in case of ECOs/SSCOs who have completed an initial period of assignment of five years Military Service as on 1 August and whose assignment has been extended beyond five years and in whose case the Ministry of Defence issues a certificate that they can apply for civil employment and that they will be released on three months' notice on a selection from the date of receipt of an offer of appointment.
- A maximum of ten years in case of a blind, deaf-mute, and orthopedically handicapped persons
- The age relaxation will not be admissible to Ex-Servicemen and Commissioned Officers including ECOs/SSCOs who are released on their request.

### 5.4 Numbers of Attempts

The number of attempts a candidate can give the exam is limited as follows:

- Six attempts for General category candidates and OBC category candidates under the Creamy layer
- Nine attempts for OBC category candidates
- To SCs/STs, there is no limit on the number of attempts.

However these candidates are requested to bear in mind, an attempt at a Preliminary Examination shall be deemed to be an attempt at the Examination. If a candidate appears in any one paper in the Preliminary Examination, he/she shall be deemed to have attempted the Examination. Notwithstanding the disqualification/cancellation of candidature, the fact of appearance of the candidate at the examination will count as an attempt. If the candidates have applied for the examination but have not appeared at the exam is not an attempt.

## 5.5 Test Structure

These are the following stages for the Test:

**Stage I:** Preliminary examination - This is a qualifying test held in May/June every year. Notification for this is published in December/January. The results are published in the first half of August. The Preliminary Examination consists of two papers of objective type (multiple-choice questions) carrying a maximum of 450 marks.

Due to the impact of covid, there are changes in the dates for the year 2021. The date of Notification was on March. The preliminary exam will be conducted in October 2021 and the final exam will be in March 2022

The Question Papers (Test Booklets) are set in English & Hindi.

Paper 1: General Studies

Paper 2: One of the optional subjects to be selected from the prescribed optional subjects

**Stage II:** Main examination - This is the main test, held in October/November every year. Results are usually published in the second week of March.

Paper 1: One of the Indian Languages to be selected by the candidate from the 18 languages included in the VIII Schedule to the Constitution (Qualifying Paper)

Paper 2: English (Qualifying Paper)

Paper 3: Essay

Paper 4 & 5: General Studies

Paper 6,7,8: Any two subjects (each having 2 papers) to be selected from the prescribed optional subjects (300 marks for each paper)

**Stage III:** Personality Test (Interview) - It is the final test and is held in April/May every year. Final results are usually announced a few days before the next preliminary examination.

## 5.6 How to Apply?

All the UPSC Exams have the same forms. The eligibility criteria and other details may differ from exam to exam. A candidate wishing to appear for more than one exam has to fill an individual form for each examination. UPSC notifies the common public about the examinations through Employment News and other leading newspapers every year in December. Applicants can procure forms and information brochures about UPSC exams from all the leading Post Offices across India. Candidates have to send the properly filled forms along with the acknowledgment card.

## 5.7 Examinations conducted by UPSC

The Civil Services of India can be classified into two types – the All India Services and the Central Civil Services (Group A and B).

### 5.7.1 All India Civil Services (AIS)

All appointments to All India Civil Services are made by the President of India.

- Indian Administrative Service (IAS)
- Indian Forest Service (IFS)
- Indian Police Service (IPS)

### 5.7.2 Central Civil Services (CCS)

The Central Civil Services is concerned with the administration of the Union Government.

**Table 5.1: Central civil services of Group A**

Armed Forces Headquarters Civil Services, Archaeological Service, Botanical Survey of India, Central Engineering (Civil) Service, Geological Survey of India, Central Engineering (Electrical/Mechanical) Service, Central Engineering Service (Roads), Central Health Service, Central Information Service Central Legal Service (Grades I) Central Labour Service, Central Power Engineering Service, Central Revenues Chemical Service, Central Secretariat Service, Central Secretariat Official Language Service, Central Trade Service, Central Water Engineering Service, Company Law Board Service, Directorate General of Civil Aviation DGCA, Directorate General of Mines Safety, Delhi and Andaman and Nicobar Islands General Central Service, Indian Audits and Accounts Service, Indian Corporate Law Service, Indian Civil Accounts Service, Indian Cost Accounts Service, Indian Defence Accounts Service, Indian Corporate Law Service, Indian Civil Accounts Service, Indian Cost Accounts Service, Indian Defence Accounts Service, Indian Defence Estates Service, Indian Defence Service of Engineers,	Indian Economic Service, Indian Engineering Services, Indian Foreign Service Indian Frontier Administrative Service, Indian Information Service, Indian Meteorological Service, Indian Ordnance Factories Service, Indian Postal Service, Indian Posts and Telegraphs Accounts and Finance Service, Indian Radio Regulatory Service, Indian Railway Service of Engineers, Indian Railway Service of Mechanical Engineers, Indian Railway Service of Electrical Engineers, Indian Railway Service of Signal Engineers, Indian Railway Stores Service, Indian Railway Accounts Service, Indian Railway Personnel Service, Indian Railway Traffic Service, Indian Revenue Service Indian Salt Service, Indian Statistical Service, Indian Telecommunication Service, Indian Trade Service, Mercantile Marine Training Ship Service, Railway Protection Force, Survey of India, Telegraph Traffic Service, Zoological Survey of India,
--	---



**Table 5.2: Central civil services of Group B**

<p>Income Tax Service,  Indian Foreign Service, - (General Cadre, Grade I and General Cadre, Grade II only)  Central Secretariat Service, (Section and Assistants' Grade officers only)  Indian Posts and Telegraphs Accounts and Finance Service, Telecommunication Wing.  Indian Posts &amp; Telegraphs Accounts &amp; Finance Service, Postal Wing,  Indian Salt Service,  India Meteorological Service,  Central Secretariat Official Language Service,  Customs Appraisers Service, - (Principal Appraisers and Head Appraisers)  Customs Preventive Service, - (Chief Inspectors)  Defence Secretariat Service  Union Territories Administrative Service</p>	<p>Central Secretariat Stenographers' Service, (Grade I, Grade II and Selection Grade officers only)  Central Health Service,  Botanical Survey of India,  Geological Survey of India,  Geological Survey of India, Survey of India,  Zoological Survey of India,  Central Electrical Engineering Service,  Central Engineering Service,  Central Power Engineering Service,  Postal Superintendents' Service,  Postmasters' Service,  Telecommunication Engineering Service, Telegraphs  Traffic Service,  Central Excise Service,  Union Territories Police Service</p>
--	---

## Chapter 6

# Graduate Record Examinations (GRE)

### 6.1 Introduction

The Graduate Record Examinations (GRE) General Test is a multiple-choice admission test for applicants to graduate schools. It is a common prerequisite for all Graduate School applicants. It is developed and conducted by Educational Testing Service (ETS)-a subsidiary of the Graduate Record Examination Board of the U.S.A. The test is a computer adaptive test (CAT) and consists of three scored sections.

The scores of this standardized, computer-adaptive format test help graduate schools assess the advanced study potential of their prospective students. GRE test scores are used by admissions or fellowship panels to supplement undergraduate records and other qualifications for graduate study. GRE offers two kinds of Examinations to enable the admissions panel to assess the applicants and their attitude towards their chosen fields of study - GRE General Test and GRE Subject Test. Most applicants to Graduate Schools are generally asked to take the GRE General Test.

### 6.2 Importance of GRE

The GRE General Test measures the skills that you've acquired over your high school and college years. It is an aptitude test because it is meant to measure your potential to succeed in graduate school. While the GRE is only one of several criteria that graduate schools use to evaluate your application, it is one of the most important. The GRE General Test contains sections that measure verbal, quantitative, and analytical writing skills.

### 6.3 Eligibility

A 10+2 pass out of any recognized Indian Board or University is a suitable qualification to take the GRE but generally, students go for it after completing their Bachelor's degree.

### 6.4 Test Structure

The total time allotted for the Computer-adaptive GRE test is 3 hours, whereas for the Paper-based test it is 3 ¾ hours. GRE offers two kinds of Examinations to enable admissions panel to assess the applicants and their attitude towards their chosen fields of study - GRE General Test and GRE Subject Test. Most applicants to Graduate Schools are generally asked to take the GRE General Test.

**GRE General Test:** Generally taken by prospective graduate students, this test measures Verbal reasoning, Analytical and Critical Writing, and Quantitative Reasoning skills of a candidate.

**GRE Subject Test:** This version of the GRE assesses candidates' knowledge level and accomplishments in a specific field of study. Unlike the GRE General Test, this test is available only thrice a year and can be taken only as a paper-based test. The scores of this test are often required for doctoral programs in the US, though some universities require the GRE Subject test scores for Masters-level programs too. The eight subjects in which the GRE subject test is presently conducted are Biochemistry, Cell, and Molecular Biology,

Biology, Chemistry, Computer Science, English Literature, Mathematics, Physics, and Psychology. Each of the three sections is scored on a scale of 200 to 800. The average scores for the GRE are about 470 for Verbal and 570 for Quantitative.

### **6.5 How to Apply?**

There are no specific dates or schedules for taking the GRE/GMAT/TOEFL. These are conducted around the year. The procedure is to first obtain a form and consequently register you for the exam.

#### **Ordering the form- Forms and their details are available (free of cost) at:**

Institute of Psychological and Educational Measurement (IPEM)

119/25-A, Mahatma Gandhi Marg. Allahabad - 211001 (U.P.), India

Phone: 0532 - 624881, 623858, Fax: 0532 - 624637

E-mail: [ets@ipem.org](mailto:ets@ipem.org)

Website: <http://ipem.org/> The United States Education Foundation in India (USEFI)

#### **Educational Advisor**

USEFI, Fulbright House, 12 Hailey Road,

New Delhi - 110 001, Phone: (011) 3328944, Fax : (011) 3329718

E-mail: [vijaya@usefi.ernet.in](mailto:vijaya@usefi.ernet.in)

**Registration:** Thereafter, to register yourself for a particular test date, you can contact Sylvan Testing Services in New Delhi.

Address: Sylvan Testing Services Pvt. Ltd., Senior Plaza 160-A, Gautam Nagar, 3rd Floor Yusuf Sarai, Behind Indian Oil Building, New Delhi 110 049, Tel: 011-6511649 Fax: 011-6529741

**Acceptable Forms of Payment:** International Credit Card: The fee can be paid to Sylvan Testing Services through any of the following international credit cards- VISA, Master, American Express over a telephone. Cheques, bank drafts, money orders payable in U.S. dollars must be drawn on banks located in the U.S and be made payable to ETSGMAT/GRE/TOEFL. If payments are made in the Indian currency, these must be made at the telegraphic transfer selling (TTS) exchange rate of the U.S. dollar equivalent. Cheques, money orders payable in Indian Rupee must be drawn on a bank in India

#### **Computer Based Test (CBT) Centres in India**

Allahabad - IPEM, Ahmedabad, Bangalore, Calcutta, Hyderabad, Madras, Mumbai, NewDelhi, and Trivandrum.

For more details view the below links:

<https://www.aafmindia.co.in/computer-based-testing>

# **Chapter 7**

## **Graduate Management Admission Test (GMAT)**

### **7.1 Introduction**

The Graduate Management Admission Test (GMAT) is a computer adaptive test standard written English in preparation for being admitted into a graduate management program, such as an MBA. More than 5,400 programs offered by more than 1,500 universities and institutions in 83 countries use the GMAT exam as part of the selection criteria for their programs site. Business schools use the test as a criterion for admission into a wide range of graduate management programs, including MBA, Master of Accountancy, and Master of Finance programs. The GMAT exam is administered in secure, standardized test centers in more than 110 countries around the world. On June 5, 2012, the Graduate Management Admission Council (GMAC) introduced an integrated reasoning section to the exam that is designed to measure a test taker's ability to evaluate data presented in new formats and multiple sources. GMAC continues to perform validity studies to statistically verify that the exam predicts success in business school programs. According to a survey conducted by Kaplan Test Prep, the GMAT is still the number one choice for MBA aspirants despite the increasing acceptability of GRE scores.

### **7.2 Format and Timing**

The GMAT exam consists of four sections: An analytical writing assessment, integrated reasoning, the quantitative section, and the verbal section. Total testing time is three and a half hours, but test takers should plan for a total time of approximately four hours, with breaks. Test takers have 30 minutes for the analytical writing assessment and another 30 minutes to work through 12 questions, which often have multiple parts, on the integrated reasoning section and are given 75 minutes to work through 37 questions in the quantitative section and another 75 minutes to get through 41 questions in the verbal section.

The quantitative and verbal sections of the GMAT exam are both multiple-choice and are administered in the computer-adaptive format, adjusting to a test taker's level of ability. At the start of the quantitative and verbal sections, test takers are presented with a question of average difficulty. As questions are answered correctly, the computer presents the test taker with increasingly difficult questions and as questions are answered incorrectly the computer presents the test taker with questions of decreasing difficulty. This process continues until test takers complete each section, at which point the computer will have an accurate assessment of their ability level in that subject area and come up with a raw score for each section.

#### **7.2.1 Quantitative section**

The quantitative section of the GMAT measures the ability to reason quantitatively, solve quantitative problems, interpret graphic data, and analyze and use the information given in a problem. The use of calculators is not allowed in the quantitative section of the GMAT. Test takers must do their math work out by hand using a dry erase pen and laminated graph paper which are given to them at the testing center. Questions require knowledge of topics such as arithmetic, algebra, and geometry. There are two types of

quantitative questions: problem-solving and data sufficiency. Scores range from 0 to 60, although they only report scores between 11 and 51.

Problem-solving questions are designed to test the ability to reason quantitatively and solve quantitative problems. Data sufficiency is a very unique question type that appears on the GMAT and is designed to measure the ability to understand and analyze a quantitative problem, recognize what information is relevant or irrelevant and determine at what point there is enough information to solve a problem or recognize the fact that there is insufficient information given to solve a particular problem.

### **7.2.2 Verbal section**

The verbal section of the GMAT exam measures the test taker's ability to read and comprehend the written material, reason, and evaluate arguments and correct written material to express ideas effectively in standard written English. The question types are reading comprehension, critical reasoning, and sentence correction questions. Scores range from 0 to 60, although they only report scores between 11 and 51.

Reading comprehension passages can be anywhere from just a few paragraphs or even one paragraph long to being several paragraphs long. Reading passages contain material from subject areas like social sciences, history, physical sciences, and business-related areas (marketing, economics, human resource management, etc.). Reading comprehension passages are accompanied by interpretive, applied, and inference questions. This section measures the following abilities:

- Understanding words and statements in reading passages
- Understanding the logical relationships between significant points and concepts in the reading passages
- Drawing inferences from facts and statements in the reading passages
- Understanding and following the development of quantitative concepts as they are presented in verbal material
- Understanding the author's point of view and their proposed arguments  
Critical reasoning questions are designed to test the reasoning skills involved in making arguments, evaluating arguments, and formulating or evaluating a plan of action. Questions are based on materials from a variety of sources. This section measures the following abilities:
  - Argument construction
  - Argument evaluation
  - Formulating and evaluating a plan of action
- Sentence Correction questions ask the test taker to determine if there is a mistake with a given sentence and if so, to determine the best way in which the sentence should be written

### **7.2.3 Integrated reasoning**

Integrated Reasoning (IR) is a new section (introduced in June 2012) designed to measure a test taker's ability to evaluate data presented in multiple formats from multiple sources. The skills being tested by the integrated reasoning section were identified in a survey of 740 management faculty worldwide as important for today's incoming students. The integrated reasoning section consists of 12 questions (which often consist of multiple parts themselves) in four different formats: graphics interpretation, two-part analysis, table analysis, and multi-

source reasoning. Integrated reasoning scores range from 1-8. Like the Analytical Writing Assessment (AWA), this section is scored separately from the quantitative and verbal sections. Performance on the IR and AWA sections does not contribute to the total GMAT score.

The integrated reasoning section includes four question types: table analysis, graphics interpretation, multi-source reasoning, and two-part analysis. In the table analysis section, test takers are presented with a sortable table of information, similar to a spreadsheet, which has to be analyzed. Each question will have several statements with opposite-answer options (e.g., true/false, yes/no), and test-takers click on the correct option. Graphics interpretation questions ask test-takers to interpret a graph or graphical image. Each question has fill-in-the-blank statements with pull-down menus; test takers must choose the options that make the statements accurate. Multi-source reasoning questions are accompanied by two to three sources of information presented on tabbed pages. Test takers click on the tabs and examine all the relevant information, which may be a combination of text, charts, and tables to answer either traditional multiple-choice or opposite-answer (e.g., yes/no, true/false) questions. Two-part analysis questions involve two components for a solution. Possible answers are given in a table format with a column for each component and rows with possible options. Test takers have to choose one response per column.

#### **7.2.4 Analytical Writing Assessment (AWA)**

The AWA consists of one 30-minute writing task—analysis of an argument. It is important to be able to analyze the reasoning behind a given argument and write a critique of that argument. The essay will be given two independent ratings and these ratings are averaged together to determine the test taker's AWA score. One rating is given by a computerized reading evaluation and another is given by a person at GMAC who will read and score the essay themselves without knowledge of what the computerized score was. The automated essay-scoring engine is an electronic system that evaluates more than 50 structural and linguistic features, including the organization of ideas, syntactic variety, and topical analysis. If the two ratings differ by more than one point, another evaluation by an expert reader is required to resolve the discrepancy and determine the final score. The analytical writing assessment is graded on a scale of 1 (the minimum) to 6 (the maximum) in half-point intervals (a score of zero means the answer was gibberish or not written on the assigned topic or the test taker failed to write anything at all on the AWA)

1. An essay that is deficient.
2. An essay that is flawed.
3. An essay that is limited.
4. An essay that is adequate.
5. An essay that is strong.
6. An essay that is outstanding.

#### **7.3 Total score**

The total GMAT score ranges from 200 to 800 and measures performance on the quantitative and verbal sections together (performance on the AWA and IR sections do not count toward the total score, those sections are scored separately). Scores are given in increments of 10 (e.g. 540, 550, 560, 570, etc.). From the most recent data released by

GMAC, the average GMAT score of all test takers is about 540. The higher a test taker's score is, the higher their level of ability was on the GMAT. Business schools place their emphasis on the test taker's combined quantitative and verbal score because it is this score that gets reported when the schools publish their class profiles of the students they admit into their program. The higher the school's average GMAT score is, the more selective that school is said to be.

The score distribution resembles a bell curve with a standard deviation of approximately 100 points, meaning that 68% of examinees score between 400 and 600.

The final score is not based solely on the last question the examinee answers (i.e. the level of difficulty of questions reached through the computer adaptive presentation of questions). The algorithm used to build a score is more complicated than that. The examinee can make a mistake and answer incorrectly and the computer will recognize that item as an anomaly. If the examinee misses the first question his score will not necessarily fall in the bottom half of the range.

All scores and cancellations in the past five years will be on a student's score report, a change from the previous policy of the last three scores and cancellations being kept on the score report

#### **7.4 Registration and Preparation**

Test takers may register for the GMAT either online at [www.mba.com](http://www.mba.com) or by calling one of the test centres. To schedule an exam, an appointment must be made at one of the designated test centres. The GMAT may not be taken more than once within 31 days, even if the scores are cancelled. Official GMAT exam study materials are available on the [www.mba.com](http://www.mba.com) online store and through third-party vendors. The cost of the exam is the US \$250.

Some students taking the GMAT use a test preparation company. Students who do not use these courses often rely on material from university textbooks, GMAT preparation books, sample tests, and free web resources.

## **Chapter 8**

### **Test of English as a Foreign Language (TOEFL)**

#### **8.1 Introduction**

The Test of English as a Foreign Language (TOEFL) measures your ability to communicate in English. TOEFL is accepted by 11,000 universities in more than 150 countries including those based in the U.S., Canada, U.K. and Europe, Australia, and New Zealand. With more than 4,300 test centers worldwide, taking the test is convenient and easy. The TOEFL measures how well you read, listen, speak, and write in English and use these skills together in the university classroom. TOEFL offers the IBT Internet-Based Test in most locations and where this is not available it offers Paper-Based Tests to applicants.

#### **8.2 Importance of TOEFL**

The test aims at evaluating proficiency in English of candidates whose mother tongue is not English. It is important to note that American English is not quite like the language we are used to in India. Their accent, in particular, is quite different. Scores in TOEFL help the colleges to judge whether the applicant, seeking admission, would be able to comprehend the lectures, etc.

You would be required to take the TOEFL test if you are planning to study at colleges and universities where the medium of instruction is English. Also, many government agencies, scholarship programs, and licensing/certification agencies use TOEFL scores to evaluate English proficiency.

Scores in TOEFL help the colleges to judge whether the applicant, seeking admission, would be able to comprehend the lectures, etc.

#### **8.3 Eligibility**

A 10+2 pass out of any recognized Indian Board or University is a suitable qualification to take the TOEFL (Test of English as a Foreign Language) test.

#### **8.4 Test Structure**

TOEFL can be taken on any working day of the month meaning it is held five days a week. It has been introduced as a computer-based test in most of the countries. The computer-based test has four sections viz Reading, Listening, Speaking, and writing sections. The Reading section will have 3 to 5 passages from academic texts; approximately 700 words long with 12 to 14 questions per passage. The duration is of 60 to 100 minutes during which a total of 36 to 70 questions need to be answered. The Score scale for this section is 0 to 30. Listening section will have 4 to 6 lectures, some with classroom discussion; each 3 to 5 minutes long with 6 questions in each lecture. This section also includes 2 to 3 conversations, each 3 minutes long with 5 questions each. This section is of duration 60 to 90 minutes during which 34 to 51 questions need to be answered. The Score scale for this section is 0 to 30. After a break of 10 minutes, the Speaking section follows. Speaking Section comprises of 2 tasks to express an opinion on a familiar topic and 4 tasks to speak based on what is read and listened to. The duration of this section is 20 minutes for 6 tasks with a score scale of 0 to 4 points converted to a 0 to 30 Score scale. Lastly, TOEFL has a Writing section with 2 tasks.



Applicants need to write 1 task based on what is read and listened to and the other 1 task is to support an opinion on a topic. These 2 tasks need to be completed in 50 minutes and will be scored on a 0 to 5 points basis converted to 0-30 score scale. The total TOEFL score will be in the 0 to 120 range.

### **8.5 Application Details**

For details like scheduling of an appointment for the test, a list of test centers, and more it is best to obtain a copy of the TOEFL Information Bulletin for Computer-Based Testing. It is a free publication and can be obtained from the Regional Registration Centre or downloaded from <http://www.toefl.org/>

## **Chapter 9**

# **International English Language Testing System (IELTS)**

### **9.1 Introduction**

IELTS, the International English Language Testing System, is designed to assess the language ability of candidates who need to study or work where English is used as the language of communication. IELTS is required for entry to university in the UK and other countries. IELTS is recognized by universities and employers in many countries, including Australia, Canada, Ireland, New Zealand, the UK, and the USA. It is also recognized by professional bodies, immigration authorities, and other government agencies.

### **9.2 Importance of IELTS**

- IELTS is accepted by over 6,000 institutions worldwide, including universities, colleges, and employers in English-speaking countries and beyond.
- Almost all universities in Australia, Canada, New Zealand, and the UK accept IELTS.
- In the USA, IELTS scores are accepted by over 2,500 universities and colleges including Ivy League and other top institutions.
- IELTS is used for immigration to Australia, Canada, New Zealand, and the UK.
- The test is offered up to four times a month by centers in more than 130 countries.
- Results are available just 13 days after the test.
- You can be sure that an IELTS score demonstrates your true ability to communicate in English across all four language skills - reading, writing, listening and speaking.
- IELTS uses Australian, North American, and British varieties of English, making it a truly international test.

### **9.3 Eligibility**

A 10+2 pass out of any recognized Indian Board or University is a suitable qualification to take the TOEFL (Test of English as a Foreign Language) test.

### **9.4 Test Structure**

All candidates must complete four Modules - Listening, Reading, Writing, and speaking - to obtain a band score, which is shown on the IELTS Test Report Form (TRF). All candidates take the same Listening and Speaking Modules, while the Reading and Writing Modules differ depending on whether the candidate is taking the Academic or General Training Versions of the Test.

#### **• Listening**

The listening module comprises four sections. Each section begins with a short introduction telling the candidates about the situation and the speakers. Then they have some time to look through the questions. The first three sections have a break in the middle allowing candidates to look at the remaining questions. Each section is heard only once.

#### **• Reading**

In the academic module, the reading test comprises three sections, with 3 texts normally followed by 13 or 14 questions for a total of 40 questions overall. The General test also has 3 sections. However the texts are shorter, so there can be up to 5 texts to read.

- **Writing**

In the Academic module, there are two tasks: in Task 1 candidates describe a diagram, graph, process, or chart, and in Task 2 they respond to an argument. In the General Training module, there are also two tasks: in Task 1 candidates write a letter or explain a situation, and in Task 2 they write an essay.

- **Speaking**

The speaking test contains three sections. The first section takes the form of an interview during which candidates may be asked about their hobbies, interests, reasons for taking the IELTS exam as well as other general topics such as clothing, free time, computers, and the internet or family. In the second section, candidates are given a topic card and then have one minute to prepare after which they must speak about the given topic. The third section involves a discussion between the examiner and the candidate, generally on questions relating to the theme which they have already spoken about in part 2.

### **9.5 Duration**

The total test duration is around 2 hours and 45 minutes for the Listening, Reading, and Writing modules.

Listening: 40 minutes, 30 minutes for which a recording is played centrally, and an additional 10 minutes for transferring answers onto the OMR answer sheet.

Reading: 60 minutes.

Writing: 60 minutes.

Speaking: 11-14 minutes.

The first three modules - Listening, Reading, and Writing (always in that order) - are completed in one day, and are taken with no break in between. The Speaking Module may be taken, at the discretion of the test center, in the period seven days before or after the other Modules.

### **9.6 How to Apply?**

#### **Option A**

- Log on to [www.ieltsidpindia.com](http://www.ieltsidpindia.com)
- Select the option "Register for IELTS"
- Select your test date and test city (you will see the seat availability status)
- Complete the online application form
- Pay the test fee by credit card (Master / Visa)
- Get instant seat booking and acknowledgment

#### **Option B**

##### **Method - I**

- Register online using the computer at the office and make payment of test fee by Credit card, get immediate confirmation of your seat (this is identical to online registration)
- Hand over the Photocopy of your Passport (first and last page) AND any observation pages.
- Hand over the Terms & Conditions document duly signed.
- Take the instant acknowledgment letter confirming your seat in the test.

## **Method - II**

- Take an application form and complete the same
- Sign the terms and conditions sheet attached to the application form.
- Attach Photocopy of your Passport (first and last page) AND any observation pages
- Pay the test fee either;
  - by Credit card or Debit card / ATM card, or by Demand Draft (demand draft must be drawn in favor of "IDP EDUCATION INDIA PRIVATE LIMITED, Payable at New Delhi") and should be made from any bank listed in the approved banks list in the Terms & Conditions document
  - By depositing cash in the ICICI bank branch via a customized ICICI deposit slip which can be either downloaded from the IDP website or taken from the IDP branch office or any input node. The original customer copy of the customized ICICI deposit slip needs to be handed over to the IDP branch office or the input node as payment proof.
  - Request the IDP branch staff or input node to enter your application form in the online registration system immediately and give you the acknowledgment of your booking and a tentative seat reservation, thereby ensuring a seat for yourself. Please note that your confirmation will be subject to the realization of the Bank draft (if you have paid the fee by bank draft)

# Chapter 10

## Training and Certification Courses

### 10.1 Introduction

Many times, depending upon the requirement industries recruit candidates having a specialization, in particular, IT programming language or a candidate having done some certification course. The list of such courses is given in Table 10.1.

**Table 10.1: List of training and certification courses**

IT PROGRAMMING LANGUAGES ASP ASP.NET / C#: Assembly Language C C++ COBOL VB <b>SWIFT</b> <b>Python</b>	OTHER IT COURSES Artificial Intelligence AutoCAD / CAE / CAM BPO / ITES / CRM / Transcript... Cloud Computing / Hosting DSP-MATLAB - Simulink Data Warehousing Embedded System  Hadoop / BigData IT-Hardware Linux / Unix Mainframe Micro-Controller Networking / CCNA / MCITP
WEB TECHNOLOGIES HTML / JavaScript / CSS / Ajax Java / J2EE Joomla / Drupal / Wordpress PHP / MySQL SEO / Web Designing	PLC / SCADA / DCS Perl Photoshop / Illustrator Robotics and Automation Ruby on Rails
DATABASE DB2 MicroSoft(MS) SQL Microsoft(MS) Access Oracle	SAP / Cognos / ABAP Soft-Skills & Personality Deve... Software Testing / QA Tally Telecom Software VLSI / Verilog <b>Arduino</b>
MOBILE TECHNOLOGIES / APPS Android Development BlackBerry Development Mobile Testing Wireless Technology iPhone Development	

# Chapter 11

## Patent Agent Examination

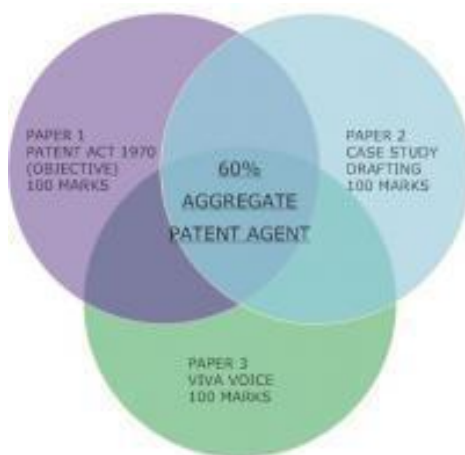
Patent Agent Examination is conducted by the Patent Office, Government of India.

### 11.1 Eligibility

Criteria for Joining the Preparation Course and Appearing For the Patent Agent Examination

1. He/She must be a citizen of India
2. He/She has completed the age of 21 years
3. He/She has obtained a [degree in science, engineering or technology from any university established under the law for the time being the force] in the territory of India or possesses such other equivalent qualifications as the Central Government may specify in this behalf, and, besides. Before applying and enrolling for Exam you need to complete the graduation examination and final year students can also apply for the exam when they are waiting for the mark sheet.

### 11.2 Pattern of Examination and Questions asked in the Patent Agent Examination



**Figure 11.1 Representation of exam pattern**

- Paper-I will have 40 objective-type questions of one mark each and descriptive-type questions of 60 marks.
- Paper-II will have a set of two questions (different sets for science and engineering) on the drafting of 30 marks each consisting of:
  - Drafting of specifications from given claims and background.
  - Drafting of claims from given specification and the rest will be descriptive/interpretative type questions of 40 marks.
- The viva-voce examination will be based only on domain knowledge.

This is a professional qualification and a lifelong qualification. The passing score is a minimum of 50% in each and overall 60%.

### **11.3 Examination Date**

This exam is conducted in January every year. The notification appears in November.

# Chapter 12

## Energy Auditor and Energy Manager Examination

### 12.1 Introduction

As per the Energy Conservation Act 2001, it is mandatory for the designated consumers to designate or appoint an Energy Manager (under clause 14(1)). Bureau of Energy Efficiency (BEE) has been empowered to specify the qualification criteria and procedures for the certification of Energy Managers and qualifications for Accredited Energy Auditors. The passing of the National level certification examination for Energy Manager is the qualification for an Energy Manager to be appointed or designated as Certified Energy Manager. For accreditation of Energy Auditors, an energy auditor shall be considered for accreditation if, he/she is a certified manager and has passed the examination in —Energy Performance Assessment for Equipment and Utility Systems conducted by the Bureau, besides meeting other criteria. More details on Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their list) Regulations, 2010 may be seen on the website it will be the accredited Energy Auditor who will be allowed to conduct the mandatory energy audit under the Energy Conservation Act 2001 and not the Certified Energy Auditor.

### 12.2 Eligibility

#### For Energy auditor

- a) Graduate Engineer (Bachelor of Engineering/Bachelor of Technology) or equivalent with **three years** of work experience involving the use of energy in operation, maintenance, planning, etc.; or
- b) A post-graduate Engineer (Master of Engineering/Master of Technology) or equivalent with **two years** of work experience involving the use of energy in operation, maintenance, planning, etc.; or
- c) A graduate Engineer with a post-graduate degree in Management or equivalent with **two years** of work experience involving the use of energy in operation, maintenance, planning, etc.

#### For Energy Manager

- a), b), c) Same eligibility criteria as per Energy Auditors; or
- a) diploma Engineer or equivalent with **six years** of work experience involving the use of energy in operation, maintenance, planning, etc.; or
- c) a post-graduate in Physics or Electronics or Chemistry (with Physics and Mathematics at graduation level) with **three years** of work experience involving the use of

**Note:** (1) Training period will not be considered as Experience. (2) Candidates without requisite experience are not eligible to appear for the examination. National Certifying Agency: BEE has retained the National Productivity Council (NPC) as the National Certifying Agency to conduct and administer the National Certification Examination for Energy Managers and Energy Auditors. Examination Dates will probably be declared in



December or January. Proposed Examination Centre's: Ahmedabad, Bangalore, Bhopal, Bhubaneswar, Chandigarh, Chennai, Cochin, Dehradun, Delhi/NCR, Goa, Guwahati, Hyderabad, Jabalpur, Jaipur, Jammu, Kanpur, Kolkata, Mumbai, Nagpur, Patna, Pune, Raipur, Ranchi, Thiruvananthapuram, and Vadodara Examination will contain the following papers:

**Table 12.1 Paper pattern of Energy Auditor Examination**

Paper	Subjects	Marks	Time
Paper – 1	General Aspects of Energy Management & Energy Audit for EM & EA	150	3
Paper – 2	Energy Efficiency in Thermal Utilities for EM & EA	150	3
Paper – 3	Energy Efficiency in Electrical Utilities for EM & EA	150	3
Paper – 4	Energy Performance Assessment for Equipment & Utility Systems (open book examination) for EA)	100	2

- The candidate appearing for Energy Manager Examination has to pass THREE papers, viz., Paper-I, Paper-II, and Paper-III and obtain a minimum of 50% of the maximum marks in each paper.
- The candidate appearing for Energy Auditor Examination has to pass all the above FOUR papers viz., Paper-I, Paper-II, Paper-III & Paper-IV and obtain a minimum of 50% of the maximum marks in each paper.
- Question Papers for Energy Manager and Energy Auditor are common for the first three papers viz. Paper-I, Paper-II, and Paper-III. Energy Auditor candidates passing the above three papers shall be eligible for the award of Energy Manager Certification.
- The degree of difficulty in Paper-IV will be comparatively much higher than in other papers.
- The medium of examination is English.
- Paper-I, Paper-II, and Paper-III shall consist of objective and descriptive-type questions.
- The Paper-IV for Energy Auditors will be an open book examination and shall consist of descriptive and numerical questions.

The candidates can refer only to the guide books supplied at the time of their registration, during the paper IV examination. No other reference books and written material will be allowed.

**Minimum Marks for Award of Certificates**

- For Certification of Energy Managers: 50% of the maximum marks in each paper in Paper-I, Paper-II, and Paper-III
- For Certification of Energy Auditors: 50% of the maximum marks in each paper in Paper-I, Paper-II, Paper-III & Paper-IV.

Prospectus can be downloaded from [www.aipnpc.org](http://www.aipnpc.org) and Registration has to be done ON-LINE at the link as per the instructions given on the website.

Supplementary candidates of previous National Certification Examinations are also required to submit their application ON-LINE at [www.aipnpc.org](http://www.aipnpc.org). Both fresh and supplementary candidates should send the printouts of filled-in applications along with the requisite fee and enclosures to the address mentioned below.

The Director, Dr. Ambedkar Institute of Productivity,  
National Productivity Council 6, SIDCO  
Industrial Estate, Ambattur, Chennai-600 098  
Tel: (044) 2625 5216 Fax: 044 2625 4904/2625 5012,  
Email: [aipnpc@vsnl.net](mailto:aipnpc@vsnl.net)

## **Chapter 13**

### **Higher Education In Aboard**

#### **13.1 United States of America**

Presently, the United States is the first choice for almost all international students to pursue their education abroad. The U.S. is chosen by a huge number of international students every year for broadening their experience as well as pursuing their education. Every year a very large number of Indian students are joining universities and colleges in the U.S. The question that arises is why so many international students go to the U.S. for pursuing their education when institutions in their native country offer academically enriching as well as practical programs. The reason is that the US education system has been endowed with top-notch resources and quality-oriented education for multiple programs that students, educators, and professionals can pursue that extra edge. There is the highest number of educational institutions facilitating higher education in the USA than any other Country and approximately 3800 colleges and universities passing on degree programs.

One of the most distinctive features of U.S. universities is the flexibility in the choice of courses within a college or university. More importantly, there is also the option for students to move between one institution and another.

Some of the main reasons for choosing the U.S. are given below:

- Excellent Academic Programs and a Broad Range of Educational Opportunities in the US
- Research Opportunities and Flexible Course Curriculum in the US
- Usage of Superior Technology for the US University Students
- Exceptional Support for International Students within the US
- Employment Opportunities for International Students in the US

##### **13.1.1 Public vs. Private Universities in the USA**

The university system in the U.S. is essentially decentralized. The individual states solely administer public universities. The universities in the U.S. have developed an autonomous accreditation organization for ensuring the degree of quality. The ratings for colleges and universities are given by the accreditation agencies on academic quality criteria such as library quality; faculty's publishing records as well as degrees held by the faculty. A university is generally bigger in comparison to a college and provides additional majors as well as research facilities. Within the university, classes are sometimes taught by graduate students. Public colleges are generally quite economical for the residents of the state since the college acquires a good amount of funding from the local or state government. Private colleges mainly depend on private sources, endowments, fees, and tuition. Even though, smaller in size, they tend to provide personalized attention.

##### **13.1.2 USA Community vs. Liberal Arts Colleges:**

Every college and university in the U.S. has a different goal. Two-year colleges generally provide students with an Associate's Degree (Associate of Arts or A.A. degree). Two-year colleges are quite often also known as Community Colleges. Generally, these colleges have open admissions and charge a lower tuition fee than private or state schools. A four-year college comprises of much more students and tends to offer a wide array of courses. They provide students with a Bachelor's Degree, for instance - Bachelor of Science

(B.S.) and Bachelor of Arts (B.A.). The community colleges are essentially undergraduate institutions. The four-year colleges within the U.S. that focus on the liberal - arts are known as Liberal Arts Colleges. These colleges essentially focus on interactive instruction. The colleges are generally residential and have smaller class sizes, fewer students, and a higher number of teachers in comparison to other universities. These colleges encourage a very high interaction level between the students as well as teachers. The classes are mainly taught by full-time faculty. Most of the Liberal Arts Colleges are private colleges, though public liberal arts colleges also exist.

### **13.1.3 Vocational or Technical Colleges in the USA**

Vocational or technical colleges essentially design their programs to provide students with appropriate knowledge as well as skills associated with specific requirements of occupation occupations or a particular job. Vocational education imparted by the colleges involves the more practical application and very less theory in comparison to academic programs taught by other colleges.

### **13.1.4 Eligibility**

Most schools require qualifications comparable to a U.S. Bachelor's (Honours) degree (Four Year Degree Program). That means a minimum of 16 years of formal education. In the Indian context, it implies qualifying for a professional four-year degree like engineering or other such courses. For Doctorate programs, most universities require a Master's degree in that subject. In a few exceptional cases like a good undergraduate engineering degree, they may offer direct admission to a Doctorate course. If you have completed a three-year degree program in India, the advisable plan of action to maximize eligibility for U.S. graduate schools is to apply for a Post Graduate degree here in India. A one-year university-affiliated program will make up for the fourth year of a U.S. Undergraduate degree. No standardized policy exists regarding the acceptance of such programs. Some universities may accept the three-year Indian Graduation Degree for a few programs. Confirmation can only be obtained by either writing directly or formally applying to the universities concerned.

### **13.1.5 Post Graduate**

Firstly, for mostly all universities, you need to have 16 years of previous education to be eligible for a graduate program in the USA (MS in US and Ph.D.)

#### **[a] Transcripts**

Students should be able to provide valid transcripts/ mark-sheets from all your educational institutes/ universities that you attended after your high-school to the US universities.

#### **[b] Standardized Test Scores**

You should have valid test scores when you apply for MS programs.

##### **1. GRE (Graduate Record Exam)**

Students can give GRE any time; the scores are valid for the next five years from that day.

##### **2. English Proficiency Tests**

Our first language isn't English, so most universities expect you to provide your English proficiency by standard tests like TOEFL, IELTS. You will need your valid test scores to be sent to universities.

- There is no minimum score for GRE; however, universities will have their own minimum English proficiency requirements. For most universities, the minimum TOEFL score is 79 or IELTS 6.5 band.
- Higher ranking universities would need TOEFL 100+. TOEFL or IELTS any one test can be taken.
- TOEFL is accepted by all universities, but few universities do not consider IELTS. So check the website of your grad school before you book your test.
- Few universities also waive TOEFL requirements for Indian students. So make sure you are aware of these facts when applying to grad school.
- With these things in your hand, you are free to apply to master's programs in any university in the US.
- Also, note that you can also apply directly to Ph.D. programs with this eligibility.

The US system is entirely different than the Indian system. There is no centralized process, you will have to apply to universities of your choice. Also, note there are no 'cut-offs' for GRE for different universities. They will consider several things of your educational background to consider you in their program like:

- The GRE, TOEFL/IELTS scores
- Class performance (your CGPA or GPA or percentage)
- The reputation of your college
- Number and quality of projects you did
- Your publications and researches
- Letter of Recommendations
- The rank of Professors and their research activities
- Work experience
- Extra-curricular activities
- Your research matches that of the university.

## **13.2 United Kingdom**

United Kingdom (UK) Universities have been renowned for their ability to maintain excellent standards in the field of higher education, both in terms of course content and student welfare. Over 150 universities and colleges equipped with the latest facilities for teaching and research offer a variety of courses. Every year students from all around the world through the UK's universities and colleges, desirous of a better standard of higher education and greater career prospects. An added incentive for Indian students is that, unlike in other countries, most UK universities recognize India's 3-year graduation system. Presently, the UK is one of the leading destinations for international students aspiring to study abroad. The UK owns the legacy of providing numerous facilities and flexibilities to the students through its excellent institutions. The UK offers much more to its international students in comparison to any other English speaking country.

### **13.2.1 Top Reasons to Study in the UK**

- The UK economy is growing immensely. London city has become a financial center globally.
- British educational qualifications are respected and universally trusted across the globe.
- The UK has been working hard on capitalizing on the increasing demand for instruction in English language and visa hurdles post 9/11 in the US.
- Students opting for the UK as a study abroad option can be assured completely that their prospects will be enhanced after course completion in the UK.
- Quality Assurance Agency (QAA) for Higher Education conducts independent audits regularly. QAA ensures that the UK educational institutions are offering education, qualifications, and awards of appropriate standards and acceptable quality
- Within the UK, international students are required to face a lower cost of education in comparison to the USA.
- An international student in the UK is permitted to work about 20 hours per week during the academic session.
- Studying in the UK not only broadens the horizons of every student professionally but teaches them to respect diverse cultures and co-exist with them peacefully.

This section discusses the various issues faced by international students applying to the U.K. for education. We discuss here eligibility criteria for UK colleges, accommodation, health insurance, and rules for taking up employment while studying.

### **13.2.2 Undergraduate (Bachelor Level)**

British students undergo thirteen years of pre-university education as compared to twelve years in India. Outstanding marks from one of the two Central Boards (CBSE or ICSE) or their equivalent or the first year of an Indian degree program are therefore usually required for direct entry into an undergraduate program in the UK. For those who do not, as yet, have these qualifications, there is a range of access or foundation courses available. Foundation courses range from four months to a year.

Applicants must satisfy both general and course requirements for admissions:

### **13.2.3 General Requirements**

A specified number of subject passes at both GCE "A" Levels and GCSE at grade C minimum is required for admissions in the UK educational system. An equivalent Indian qualification such as a good score in the CBSE and ICSE etc.

### **13.2.4 Course Requirements**

Course requirement details can be obtained from prospectuses of institutions which are available at the Education Counselling Service located in the British Council offices or Libraries. For Entry into Oxford, Cambridge, and London University, A level results are required. This in Indian context would mean one year in a college after 12 years of education

### **13.2.5 Post Graduate (Master's and Doctorate level)**

Most UK universities accept the Indian graduation system of three years for entry into most postgraduate courses. An Indian bachelor's degree like B.A., B.Com. or B.Sc. is equivalent to a British Bachelor (Ordinary) Degree.

However, some courses and universities may require a qualification equivalent to a British Bachelor (Honours) Degree, which requires 16 years of formal education, which would mean another year after graduation or a four-year degree course like B.E., B.Tech or other such courses. For most Universities, a good first degree from a leading university in India or its equivalent is essential.

### **13.2.6 British Degree Indian Equivalent Degree**

British Bachelor (Ordinary) Degree A three-year Indian Graduation Degree like B.A. or B.Sc. and other such courses. British Bachelor (Honours) Degree a four-year Indian graduation course like B.E. or B.Tech. or other such courses or A postgraduate degree, from an Indian university, like M.A., M.Sc., or other such courses. British Master's Degree A postgraduate degree like M.Tech. or M.E. from I.I.T. or I.I.Sc. and other such colleges

## **13.3 Singapore**

Education has always played an important role in the growth and development of Singapore society. In the era of advancement and development, a knowledge-based economy is a driver of the global community. Students from all over the world choose Singapore universities as their career option to grow and gain knowledge. The strength of Singapore's Education system lies in its bilingual policy (English with some other language) and a broad-based curriculum where innovation and entrepreneurship command a premium. There's nothing like the transformative experience of studying abroad to gain new perspectives, create fresh impressions, and be inspired by what's happening beyond your corner of the world.

### **13.3.1 Top reasons to study in Singapore**

#### **Educational system**

The Singapore education system also follows closely to that of the British, which has a robust educational qualification system that is widely accepted by education institutes worldwide. As such, students can be assured of a competitive edge against their global counterparts should they wish to pursue higher education in other student-friendly countries such as the United Kingdom, Australia, or the USA.

Additionally, the bilingual (English and Mother Tongue) language policy put in place, places a great deal of focus on the English language which will make picking up the language a much simpler task than it appears.

#### **Best of East and West**

No other city offers a more alluring mix of cutting-edge infrastructure, a world-class education system, and a dynamic cosmopolitan vibe thanks to a blend of Eastern and Western cultures. Beneath the city's towering skyscrapers, you'll discover the vibrant sights and sounds of ethnic precincts like Chinatown, Little India, and Kampong Glam.

#### **Cultural Inspiration**

Stimulate your mind in an environment where ethnic diversity is celebrated, and immerse your soul in Singapore's melting pot of Chinese, Malay, Indian and Eurasian history and culture. As English is widely used, you will never feel out of place while experiencing the local culture.

## **24/7 Fun in and out of the Sun**

Outdoor sports fans and sun-seekers will have a blast thanks to the year-round sunny climate. Activities such as wakeboarding, windsurfing, overnight biking excursions, and dragon boat racing are readily available for the full tropical island experience. Culture have their pick from the museum, international and local music, and art offerings throughout the year.

### **The Living Space**

There is a good reason why Singapore is also referred to as a 'city in the garden'. With lush belts of greenery contributing to the cityscape, Singapore offers a comfortable living environment. The city's hostels, home stays, private and public apartments are unrivaled for their modernity and comfort.

It is easy and inexpensive to get around Singapore on our integrated transport system of efficient air-conditioned bus services, modern Mass Rapid Transit (MRT) lines, and affordable taxi services.

### **Gateway to Asia**

Singapore's excellent geographical position makes travel within the Asian region a breeze. Using Singapore as your base, explore the ancient cities of Cambodia or island-hop your way through Indonesia or Thailand. China and India are a mere 5-6 hour flights away. With so many budget airlines operating from Singapore's Changi Airport, backpacking is an affordable reality.

Overall, with an internationally acclaimed education system and a modern, cosmopolitan environment, students can look forward to enjoying a truly rewarding and fulfilling educational and cultural experience in Singapore.

#### **13.3.2 Eligibility for undergraduate stream**

- Students must have completed at least twelve years of education before applying for undergraduate courses in Singapore universities.
- Applications for admissions are available from October to next year March.
- SAT scores are not required for international students but mentioning the scores help gain entry easily.
- TOEFL scores are mandatory for students seeking admission in Singapore. Final interviews might be conducted before gaining admission into any of the universities.

## **13.4 New Zealand**

The system of New Zealand education is world-class, modern, and responsive. It combines proven, traditional principles of education with innovation, creativity, and fresh thinking to produce leaders and citizens equipped for the 21st century. The education system of New Zealand was introduced by the British colonial authorities during the colonial period. It is based on universal primary and secondary education to the age of 15 and a more diverse system after that point involving the later years of secondary school. Universities were more elite institutions but are now much more widely accessible since their expansion in the last



decade that involved increasing student numbers in existing universities and redesigning other tertiary institutions. We seek a world-leading education system that equips all New Zealanders with the knowledge, skills, and values to be successful citizens in the 21st century. In the current knowledge age, learners need to know how to problem-solve, synthesize information, work with others, create, and innovate.

#### **13.4.1 Top reasons to study New Zealand**

- Whilst New Zealand is a small and distant destination, it is a unique country in which to study and gain a qualification. You'll find the rewards are well worth making the journey for, as well as training that simply can't be found anywhere else in the world.
- No wonder New Zealand is the ultimate outdoor adventure playground, offering every kind of thrill and degree of blood-pumping adrenalin adventure to pure hedonistic relaxation and pleasure.
- New Zealanders are famed for their friendliness, hospitality, and warmth to overseas visitors, and enjoy meeting folk from other cultures
- You can expect a high standard of living conditions
- Secondary and tertiary yet without any dangerous animals
- Living and tuition costs compare well with other countries
- Travel to New Zealand is easy, with direct flights from most major cities
- Of course, there are many sports activities: schools, universities, and colleges offer excellent sports facilities for students who want to play tennis, squash, cricket, basketball, soccer, netball, softball, or rugby. Many of these activities and sports are within walking distance or easy traveling time from student campuses.
- Education in New Zealand offers an attractive and stimulating academic environment. The institutions are diverse in size and location and offer a wide range of general and specialist courses
- The quality of a New Zealand tertiary education is well-recognized internationally
- New Zealand offers a safe and stable democratic political environment
- A great variety of recreational and cultural experiences are available in a country renowned for its natural rugged beauty.

#### **13.4.2 Eligibility**

Most New Zealand universities accept the Indian graduation system of three years for entry into most postgraduate courses. An Indian bachelor's degree like B.A., B.Com. Or B.Sc. is equivalent to a New Zealand Bachelor (Ordinary) Degree. However, some courses and universities may require a qualification equivalent to a New Zealand Bachelor (Honours) Degree, which requires 16 years of formal education, which would mean another year after graduation or a four-year degree course like B.E., B.Tech, or other such courses.

### **13.5 Ireland**

Ireland has a long history of welcoming international students going back more than a thousand years. In the dark ages of 7th century Europe, Ireland was a beacon of learning, and students from around the continent traveled to study in Irish monasteries. We continue that proud and historic tradition today, and for the past 50 years, Ireland has been a location

of choice from students around the world, including North America, Europe, the Gulf, and Asia. Education in Ireland is a transforming experience, which adds significant value to the personal development and economic potential of our graduates and binds them to the global Irish family, a network that will continue to be open to them no matter where in the world they travel. We have a range of strengths which give us a competitive advantage.

- We are a small, safe, and friendly country.
- Our people are renowned for attributes such as innovation, creativity, and collaboration.
- We are a member of the European Union and have extensive global links through our worldwide Diaspora.
- We are an English-speaking country with a unique cultural heritage.
- We have an education system that has had a long history of international engagement and which is globally respected
- In the past thirty years, successive Irish Governments have put enormous resources into education and research. The reputation of our higher education system has grown considerably, and our research is now making an international impact. Our educational infrastructure is of a very high level. All of our universities and the Dublin Institute of Technology are ranked in the top 5% globally. US President Barack Obama has called the Irish people —among the best educated in the world. Our academic quality assurance systems are highly regarded, and we will shortly be supplementing them by introducing nationally-enforced standards and an international education mark for the treatment of international students.

Our qualifications are internationally recognized, and our higher education system provides the full academic range through arts and the humanities, the social sciences, medicine, science, business and management and engineering. We have a supportive learning environment. Dedicated international offices work closely with administrative, academic and specialist staff to fully support students throughout their time in Ireland. Through these specialist support structures, students receive direct access to information, facilities, services and staff.

### **13.5.1 Eligibility**

For bachelor's studies, you must have completed upper secondary studies in one of the signatory countries of the Lisbon Convention, have a valid school leaving certificate, and qualify for higher education studies in your home country, you may also qualify for higher education studies in Ireland. Coming to Higher Studies you should have completed your first cycle i.e. bachelor's degree. There are some conditions for non-EU students they must show that they are progressing academically and passing exams to advance to the next year of the program also must provide proof of full payment of courses to the higher education institution. You can't avail of any State Benefits. You can only stay in Ireland for a maximum of seven years. You can't move from a degree program to a language and non-degree program. Students must show a letter of renewal to prove they have maintained private medical insurance.

## 13.6 Germany

Known all over the world for its expertise in developing and manufacturing complex industrial goods like cars and heavy machinery, Germany's four important sectors of industry are automotive manufacture, mechanical engineering, electrical engineering and chemicals. Germany is one of the European countries and a dream destination for students who want to settle in Europe after their studies. Well known for courses in Engineering especially automotive. The country has the 4th largest economy in the world, and research and development form an integral part of the economy.

### **Legend of German engineering**

Automotive manufacture is the forte of Germans. Around 30 percent of all internal company R&D spending goes to this sector.

### **Upcoming biotechnology hub**

Growing at an unprecedented pace, as of today around 29,000 people are employed in this fast-emerging field. Biotechnology research has become fundamental to advances in the fields of medicine, food technology and the chemical industry.

### **Research focus**

A joint initiative by universities, non-university institutes, companies and public institutions has put Germany on top of the global cutting-edge research. Top research institutes include Fraunhofer Gesellschaft (Applied) and Academies of Science (Basic Sciences).

### **Multiple attractions**

Advantages of studying in Germany include low tuition fees (EUR 300-500 per semester), research-oriented curriculum, industrial internships, stable work visa after studies, high-paying jobs after studies, English as a medium of instruction, permission for part-time work and high standard of living.

### **More Indian students**

The year 2011 saw a steep rise in the number of Indian students selecting Germany for postgraduate study, and of late more Germany universities offer free study in the English language. Moreover, jobs in domestic firms are available for students who study there. Germany is putting considerable efforts to attract international talents to study in there. This is the first European nation to get the EU Blue Card Bill passed in addition to its own German Green Card System.

#### **13.6.1 Eligibility**

Admission requirements are set very high by the German Universities. For UG courses as much as 90% is expected for admission. For PG courses, students are expected to have at least 70-75% from a reputed Indian University. They are also required to appear for GRE (by some Universities) and a score of above 300 should do the needful. Also, it can boost a student's profile if he or she appears for the course even though the University has not requested it. IELTS (6.0) or TOEFL (100) is also required.

#### **Application Procedure**

There are two intakes in a year for admission in Sep/Oct and in March/April. The application and visa process in total takes about 9 months so students need to plan

accordingly. The deadline for Sep/Oct intake is 15 Jan and for March /April intake is 15 July. Hence, an early application is highly recommended. Once the University receives the application it may take about 3-4 months to inform students of the outcome. Not all Universities may intimate, if the application is incomplete or lacking any documents, hence it is recommended that students send all the requested documents in one go to avoid any last-minute issues

## **13.7 Canada**

Canada is a wonderful place to study which is fast emerging as a hot destination for many Bangladeshi students who are seeking quality education in a peaceful environment. Canadian education boasts of many USPs such as international students have the option of living and working in Canada, once they complete their studies, provided they possess the necessary qualifications and expertise. Canada is a vast country and offers top-rated education in almost all the disciplines of studies. Several Canadian universities are the world's top rank holders. The McGill University and the University of Toronto stand out for their excellence in education. Here people are friendly and welcoming, and Toronto, the country's financial capital, is quite similar to London and perhaps the most cosmopolitan city on earth. If Canada is your dream destination for your higher studies, join right here.

### **13.7.1 Top reasons to study in Canada**

- The United Nations has ranked Canada as one of the best places in the world to live in. It has been considered the ideal destination for quality studies. This assessment is based upon Canada's achievements in terms of educational attainment, life expectancy, national income, and general quality of life.
- Canada is abundant in freshwater, comfortable population density, low incidence of violent crime, and a health care system that is a model for the world.
- Canada's education system is excellent and ranks among the best in the world. Moreover, its tuition fees are among the lowest in English-speaking countries.
- Canada boasts a wide range of quality educational institutions for both degrees and diplomas in technical and professional disciplines.
- International students who have graduated from a Canadian university or college have the opportunity to work in Canada for up to one year after they receive their degree or diploma.
- For over a century, Canada's two official languages (English and French) have been taught as second languages that is why they are world leaders in language training. International students often choose to take language courses before beginning a regular academic program.
- It is a multicultural country with a high standard of living.

### **13.7.2 Eligibility**

Most schools require qualifications comparable to a Canadian Bachelor's (Honours) degree (Four Year Degree Program). That means a minimum of 16 years of formal education. In the Indian context, it implies qualifying in a professional four-year degree like engineering or other such courses. If you have completed a three-year degree program in

India, the advisable plan of action to maximize eligibility for Canadian graduate schools is to apply for a Post Graduate degree here in India. A one-year university-affiliated program will make up for the fourth year of a Canadian Undergraduate degree. No standardized policy exists regarding the acceptance of such programs. Some universities may accept the three-year Indian Graduation Degree for a few programs. Confirmation can only be obtained by either writing directly or formally applying to the universities concerned.

## **13.8 Australia**

Despite its size and dependence on rural populous Australia is one of the most developed and urbanized countries in the world. Australia has experienced the strongest employment growth of any OCED nation. The Australian government with its long-term planning and increased job opportunities has considerably brought down the unemployment level. Work is split up sector-wise. The various sectors under which employment is sought in Australia are the Chemicals and Plastic industry, Electrical and Electronics industry, Information and Technology Industry, Agricultural and Rural Farming, Processed Foods, Manufacturing, Small Business, and the services sector. However, those applying for work in Australia usually are experts in fields wherein expertise is not easily found within Australia.

### **13.8.1 Top reasons to study in Australia**

- Australia offers hundreds and thousands of courses. You have the freedom to choose the path that you feel matches your needs.
- Australian studies promote innovative, creative, and independent thinking.
- You are encouraged to think about original, practical, and real-world problems.
- After graduating from Australia, you will be highly sought after by Australian and international employers.
- Australian education has a strong international reputation. It is known for its effective structure and inventive policy developments.
- Australian institutions have established campuses offshore and created innovative partnerships in other countries to deliver courses in student's home countries.
- Australian system of education and training is subject to continuous improvement and review by government, industry, and professional bodies to maintain and improve its already high standard.

### **13.8.2 Eligibility**

Most Australian universities accept a graduation system of three years for entry into most postgraduate courses. An Indian bachelor's degree like B.A., B.Com. Or B.Sc. (ordinary) is equivalent to an Australian Bachelor (Ordinary) Degree. However, some courses and universities may require a qualification equivalent to an Australian Bachelor (Honours) Degree, which requires either an honors graduation degree like B.A. (H), B.Com (H), etc. or 16 years of formal education, which would mean another year after graduation or a four-year degree course like B.E., B.Tech and other such courses. For most Universities, a good first degree from a leading university in India or its equivalent is essential.

**Table 13.1 List of 50 top technological universities in the world**

QS RANK	SCHOOL NAME	COUNTRY	OVERALL
1	Massachusetts Institute of Technology	United States	100
2	University of Oxford	United Kingdom	99.5
3	Stanford University	United States	98.7
4	University of Cambridge	United Kingdom	98.7
5	Harvard University	United States	98
6	California Institute of Technology	United States	97.4
7	Imperial College London	United Kingdom	97.3
8	ETH Zurich - Swiss Federal Institute of Technology	Switzerland	95.4
9	University College London	United Kingdom	95.4
10	University of Chicago	United States	94.5
11	National University of Singapore (NUS)	Singapore	93.9
12	Nanyang Technological University (NTU)	Singapore	90.8
13	University of Pennsylvania	United States	90.7
14	EPFL	Switzerland	90.2
15	Yale University	United States	90.2
16	The University of Edinburgh	United Kingdom	89.9
17	Tsinghua University	China	89
18	Peking University	China	88.8
19	Columbia University	United States	88.7
20	Princeton University	United States	88.6
21	Cornell University	United States	88.3
22	The University of Hong Kong	Hong Kong	86.3
23	University of Tokyo	Japan	86.2
24	University of Michigan-Ann Arbor	United States	86.2
25	Johns Hopkins University	United States	85.9
26	University of Toronto	Canada	85.3
27	McGill University	Canada	84
28	The Australian National University	Australia	84
29	The University of Manchester	United Kingdom	84
30	Northwestern University	United States	82.8
31	Fudan University	China	82.6

32	The University of California, Berkeley (UCB)	United States	82.5
33	Kyoto University	Japan	82.3
34	The Hong Kong University of Science and Technology	Hong Kong SAR	82.2
35	King's College London	United Kingdom	82
36	Seoul National University	South Korea	81.7
37	The University of Melbourne	Australia	81.4
38	The University of Sydney	Australia	80.4
39	The Chinese University of Hong Kong (CUHK)	Hong Kong SAR	80.3
40	University of California, Los Angeles (UCLA)	United States	79.7
41	KAIST – Korea Advanced Institute Science & Technology	South Korea	79.1
42	New York University (NYU)	United States	78.9
43	The University of New South Wales (UNSW Sydney)	Australia	77.7
44	Universite PSL	France	77.6
45	Zhejiang University	China	77.4
46	University of British Columbia	Canada	77.1
47	The University of Queensland	Australia	76.6
48	University of California, San Diego	United States	76.1
49	Institute Polytechnique de Paris	France	75.9
50	The London School of Economics and Political Science (LSE)	United Kingdom	75.8

# Chapter 14

## Scholarships

### 14.1 Introduction

A scholarship is a form of financial aid awarded to meritorious students so that they can meet the cost and financial expenses of studying in some of the top educational institutions and universities of the world. Almost every country has various types of scholarships on offer for students and the eligibility criterion for each scholarship varies from institution to institution. Both the Government and Non-Government educational institutions provide financial assistance to students in the form of scholarships in India. With the help of scholarships and schemes, students can continue their studies without putting too much monetary burden on their families.

### 14.2 Government Scholarships

#### 14.2.1 Schemes for Higher Education

Higher Education is the shared responsibility of both the Centre and the States. The coordination and determination of standards in institutions is the constitutional obligation of the Central Government. The Central Government provides grants to UGC and establishes Central Universities in the country. Meritorious students, from families with or without necessary means, need an incentive or encouragement to keep on working hard in their studies and go to the next level of education in their academic career. This is where scholarships and education loans play a crucial role. Following are some significant fellowship schemes/scholarships awarded by the various institutions:

- National Scholarships
- Post-Doctoral Research Fellow (Scheme)
- Junior Research Fellowships for biomedical sciences
- All India Council for Technical Education Scholarships
- Department of Science and Technology grants and fellowships
- DST's Scholarship Scheme for Women Scientists and Technologists
- Biotechnology fellowships for doctoral and postdoctoral studies by DBT
- Scholarships /Awards at Undergraduate & Postgraduate level in various science courses at the University of Delhi
- Fellowships/Scholarships/Awards by the Jawaharlal Nehru University
- Rajiv Gandhi National Fellowship for SC students to pursue higher education such as M. Phil. and Ph.D.
- Ramanujan Fellowships for brilliant scientists and engineers from all over the world
- JC Bose National Fellowships
- Sports Authority of India promotional schemes
- Empowerment of Persons with Disabilities - Schemes/Programs
- Scholarship Schemes for ST Students by Ministry of Tribal Affairs
- Post-matric Scholarships for SC /ST students
- Scholarships for Minority Students
- Online Minority Students Welfare Scholarships System



- National Fellowship for OBC Candidate
- Maulana Azad National Fellowship for Minority Students

### **14.2.2 International Scholarships/Fellowships**

There are several scholarships available for students to pursue higher studies outside India. The Government of India, foreign countries and private institutions offer international scholarships to academically outstanding students. The Ministry of Human Resource Development, Department of Higher Education administers only those scholarships/fellowships which are being offered by the foreign countries under Cultural Exchange Programs and other programs. The subject fields are generally chosen for those subject fields, facilities for which are available in the donor country and also keeping in view the national needs.

- External Scholarships for higher education
- Externally-Aided Projects in Technical Education
- UNESCO International Fellowships/Awards/Prizes
- Externally Aided Projects/International Collaboration in Technical Education
- National Overseas Scholarship Scheme by the Indian Government
- Scotland's Saltier Scholarships

### **14.2.3 Student Loans**

The government endeavors to provide primary education to all and sundry on a universal basis, higher education is progressively moving into the domain of the private sector. Higher education is getting more and more costly and hence the need for institutional funding is necessary for this area. Therefore, educational loans are an investment in economic development and prosperity. The government of India in consultation with the Reserve Bank of India (RBI) and Indian Banker's Association (IBA) has framed a Comprehensive Educational Loan Scheme - An external website that opens in a new window to ensure that no deserving student in the Country is deprived of higher education for want of finances. The new scheme covers all types of courses including professional courses in schools and colleges in India and abroad.

#### **Central Scheme for Educational Loans**

The Government of India has launched a scheme to provide full interest subsidy on loans taken by students belonging to economically weaker sections from scheduled banks under the Educational Loan scheme - External website that opens in a new window of the 53 Indian Banks' Association, for pursuing any of the approved courses of studies in technical and professional streams, from recognized institutions in the country. The National Handicap Finance and Development Corporations - External website that opens in a new window also awards educational loans to disabled students to pursue higher education in India and abroad. Similarly, the National Scheduled Tribes Finance and Development Corporation (NSTFDC) - External website that opens in a new window and National Scheduled Castes Finance and Development Corporation - External website that opens in a new window are also running separate loan schemes for Scheduled Tribes - External website that opens in a new window and Scheduled Castes - External website that opens in new window students.

### **14.3 Scholarship by Professional Organizations and companies**

#### **14.3.1 NTPC Scholarship Scheme**

Scholarships will be awarded by the NTPC for scheduled caste/scheduled tribe /physically challenged students pursuing a full time degree course in engineering in any one of the following branches electrical, mechanical, Instrumentation, computer science, electronics.

#### **Value and duration of the scholarship:**

The scholarship amount is 1500/- per month. The scholarship is paid from the second year of the course until the course duration.

**Website:** [www.ntpc.co.in](http://www.ntpc.co.in)

#### **14.3.2 Indian Oil Corporation Scholarships**

These scholarships are available for full-time courses in which engineering students are also eligible. Scholarships are awarded to students having confirmed admission in the first year of a full-time engineering degree course. Students whose gross joint income of the family from all Sources below Rs 1, 00,000 are only eligible.

#### **Duration and amount of scholarship:**

The amount of scholarship is Rs. 3000/- per month and the available scholarships are 300.

**Website:** [www.iocl.com](http://www.iocl.com)

#### **14.3.3 Jntata Endowment Loan Scholarships**

JN TATA Endowment Loan Scholarships would be awarded for higher studies abroad in all disciplines in which engineering graduates with a good academic record are also eligible.

#### **Amount of loan:**

The JN Tata endowment scholarship rewards range from INR 1,00,000 to INR 10,00,000. Additionally, the selected candidates may receive a gift amount of up to INR 7,50,000 and travel assistance of up to INR 50,000.

**Website:** [www.jntataendowment.org](http://www.jntataendowment.org)

#### **14.3.4 Larsen & Toubro Ltd Scholarships**

L&T LTD ECC- the construction division of L&T sponsors deserving engineering graduates interested in pursuing M.Tech in Construction Technology & Management at IIT Delhi and Madras.

#### **Amount and duration of the scholarship:**

A stipend of 9000/-per month for the 40 engineering graduates for the 24- month course who completed the course will be considered for absorption in regular employment in the company. The scholarship is open to all postgraduate students.

**Website:** [www.lntecc.com](http://www.lntecc.com)

#### **14.3.5 VIT University Ignite Scholarships**

VIT University, one of India's top Universities offers to IGNITE Scholarships for toppers all over India worrying about financial hurdles.

#### **Amount and duration of the scholarship:**

The scholarship will benefit around 200 top scholars across the country. The scholarship will cover the tuition fee for the entire four years of the engineering course they wish to pursue at VIT University.

**Website:** [www.vit.ac.in](http://www.vit.ac.in)

#### **14.3.6 University Grants Commission Junior Research Fellowship**

The University Grants Commission awards Junior Research Fellowships in Engineering & Technology for the persons who have a Master's Degree in Engineering/ Technology / Pharmacy with at least 55% marks from a recognized University to provide an opportunity to research scholars to undertake advanced study and research in Engineering and Technology and leading to Ph.D.

##### **Amount and duration of scholarships:**

The fellowship of Rs.14,000/- per month for the initial two years and Rs.15,000/- per month for the remaining tenure. 22.5% of Research Fellowships are reserved for SC / ST candidates.

**Website:** [www.ugc.ac.in](http://www.ugc.ac.in)

#### **14.3.7 Kishore Vaigyanik Protsahan Yojana - Kvpv Fellowship**

Kishore Vaigyanik Protsahan Yojana Fellowships are awarded by the Department of Science and Technology, Government of India for students studying in Basic Sciences, Engineering and Medicine. Students enrolled in I/II year B.E. /B.Tech. /B.Arch. during the academic year, 2010 - 2011 and have secured a minimum of 60% (50% for SC/ST) marks in aggregate in the X & XII Standard Board Examinations.

##### **Amount and duration of scholarship:**

Fellowships of Rs. 5000/- to Rs. 7000/- per month are awarded.

**Website:** [www.kvpy.iisc.ernet.in](http://www.kvpy.iisc.ernet.in)

#### **14.3.8 Central Sector Scheme of Scholarships**

The Ministry of Human Resources Development, Department of Higher Education, Government of India has introduced a new scholarship scheme titled Central Sector Scheme of Scholarship for College and University Students for graduate / postgraduate studies in colleges and universities and professional courses such as Engineering, medical, etc. The students who have scored a minimum of 80% of marks in Class XII of 10+2 pattern or equivalent are eligible.

##### **Amount and duration of scholarship:**

82000 scholarships per annum (41000 for boys and 41000 for girls) will be awarded. The scholarship will be given at Rs.1000/- per month and would be paid for 10 months in an academic year

**Website:** [www.cbse.nic.in](http://www.cbse.nic.in)

#### **14.3.9 Sophia Merit Scholarships**

Sophia Scholarships will be awarded to students entering the first year of a Bachelor's degree in Engineering or Medicine. Students from any part of India are eligible and those who secure admission by merit and the Financial Resource of the Parents will be considered for scholarships.

##### **Amount and duration of scholarships:**

13 scholarships will be awarded every year and the Scholarship amounts to Rs. 100000 for engineering and around Rs.1, 15000 for medicine.

**Website:** [www.sophiascholarship.org](http://www.sophiascholarship.org)

#### **14.3.10 GITM University Financial Assistance**

GITM Institute of technology, Vizag which offers engineering courses through the GAT exam provides for a full waiver of fees for the top 10 rankers in the GAT exam and

50% waiver for the next 90 members irrespective of the financial background of the student. GITAM University also provides for financial assistance in the form of merit fellowships/ merit-cum-means scholarships to the deserving candidates. Merit-cum-means scholarships will be awarded to 5% of students joining in various programs of GITAM Institute of Science @Rs.2000/-per month depending on the performance of the student in the first-semester end examinations and income of the parent (subject to a maximum income of Rs.2,00,000/ - per annum). Merit fellowships will be awarded to 10% of students of each M.Sc. programme at Rs.2000/- per month depending upon their performance at the first-semester end examinations.

**Website:** [www.gitam.edu](http://www.gitam.edu)

#### **14.3.11 Koneru Lakshmaiah College of Engineering Scholarships**

KLCE, Guntur offers scholarships to toppers who join in various courses in the college through entrance exams like KLU EEE, EAMCET, AIEEE, and IIT-JEE. 100% fee waiver for 1st to 10th rank in KLU EEE, 1ST TO 100TH rank in EAMCET, 1ST to 1000 rank in AIEEE, 1ST to 2000th rank in IIT-JEE.

**Website:** [www.kluniversity.in](http://www.kluniversity.in)

#### **14.3.12 Indian School of Mines, Dhanbad scholarships**

Indian school of Dhanbad offers Merit-cum-Means Scholarship and Merit-cum-means free ship to the students enrolled in each course of the college are shortlisted on basis of qualifying exam with a minimum score of 60%.

##### **Amount and duration of the scholarship:**

Merit-cum-Means Scholarship is offered to 25% of students with an exemption from tuition fees and an amount Rs. 800 per month. Merit-cum-means free ship to 10% of students enrolled in the course.

**Website:** [www.ismdhanbad.ac.in](http://www.ismdhanbad.ac.in)

#### **14.3.13 Jaypee Institute of Information Technology**

Scholarships to meritorious students: The Management of the college is offering scholarships to the students who take admission in the first year of the 4-year UG program at any of the three Institutes i.e., JIIT (Noida), JUIT (Waknaghat) or JIET (Guna) with an overall All India Rank of less than 1000 in AIEEE exam conducted by CBSE.

##### **Amount and duration of scholarships:**

Free education for the entire duration of the undergraduate programme.

**Website:** [www.jiit.ac.in](http://www.jiit.ac.in)

#### **14.3.14 International Institute of Information Technology, Allahabad scholarships**

IIIT, Allahabad offers Merit Scholarships to toppers in each specialty every year, based on their past performance at the Institute. Students from economically weaker sections of the society (those having income less than Rs. 1 Lakh per year) are also granted scholarships from the Ministry of Social welfare.

**Website:** [www.iiita.ac.in](http://www.iiita.ac.in)

#### **14.3.15 National Dairy Research Institute, Karnal**

National Dairy Research Institute, Karnal offers Scholarships to the meritorious BTech (Dairy Technology) students who need financial assistance and who have a good academic record and are making diligent efforts to pursue higher education. The National Talent Scholarship (NTS) Rs. 1000 per month awarded by the Indian Council of Agricultural

Research (ICAR) on merit provided that the domicile of the candidate is other than Haryana State.

**Website:** [www.ndri.res.in](http://www.ndri.res.in)

#### **14.3.16 Scholarships offered by foreign countries**

Ministry of Human Resource Development, Department of Education administers scholarships/ fellowships which are being offered by the foreign countries under Cultural Exchange Programs and other Programs. The subject fields are generally chosen for those subject fields, facilities for which are available in the donor country and also keeping in view the national needs. At present, the following countries are offering Scholarships for India, China, Korea, Israel, and Japan, commonwealth scholarship (U.K), Belgium, Italy, Mexico, Norway, Turkey, New Zealand, Czech, Slovak and Agatha Harison.

**Website:** [www.education.nic.in](http://www.education.nic.in)

#### **14.3.17 Cradila Education Loan**

Cradila an HDFC Ltd venture provides education loans to students for study in India or abroad. Loan up to 100% of educational expenses and loan sanction before admission.

**Website:** [www.credila.com](http://www.credila.com)

#### **14.3.18 Model Educational Loan Scheme for Pursuing Higher Studies in India and Abroad**

The Educational Loan Scheme provides financial support from the banking system of India to deserving meritorious students for pursuing higher education in India and abroad.

##### **Eligibility**

Student eligibility: Secured admission to professional/ technical courses in India or Abroad through Entrance Test/ Merit Based Selection process.

##### **Amount of the scholarship:**

Need based finance to meet the expenses will be considered;

- Studies in India - Maximum upto Rs. 10 lakhs.
- Studies Abroad - Maximum up to Rs. 20 lakhs.

# Chapter 15

## Opportunities in IT Industries

### 15.1 Introduction

The IT and ITes sector includes IT services, engineering design and R&D services, ITES (IT-enabled services), or BPO and hardware. The IT/ITeS sector has led to employment opportunities, both direct and indirect, of nearly 2.8 million and around 8.9 million respectively. This growth is expected to increase to more than 14 million (direct and indirect) by 2015 and around 30 million by 2030. IT/ITES industries are highly localized and clustered in seven cities as of today. These are Bangalore, Hyderabad, Chennai, Gurgaon/ Noida/ New Delhi, Kolkata, Mumbai, and Pune. Infrastructure limits and scarcity of land has recently led to expansion to newer places like Ahmedabad, Bhubaneshwar, Chandigarh, Coimbatore, Jaipur, Kochi, Madurai, Mangalore, Mysore and Trivandrum. Information Technology (IT) is defined as the design, development, implementation and management of computer-based information systems, particularly software applications and computer hardware. Today, it has grown to cover most aspects of computing and technology. The largest firms globally include IBM, HP, Dell and Microsoft. The Information Technology-Enabled Services (ITES) industry provides services that are delivered over telecom or data network to a range of external business areas. Examples of such business process outsourcing (BPO) include customer service, web-content development, back-office management and network consultancy, etc.

The sub-branches that make radical changes like the Internet of Things, Data Science, Machine Learning, and Artificial Intelligence will bring in nearly 3500 million new devices by 2022. The integration of this technology with energy engineering for efficient energy transfer, supervision and control will open new jobs for electric engineers. The skills required are available at one click of the Internet. It is easy to complete some online courses while studying electrical engineering regularly. If we adopt modern programming skills, software engineers, software developers and programmers in the information and technology sectors can also be identified as job positions, which include Infosys, Cognizant, and T. C. S.

Various positions for a graduate engineer are as follows

- Wizard of apps- Application Development as a profession
- Computer network specialist
- Ethical Hacker
- Management information systems (MIS) professional
- IT tester
- Software Engineer
- Software Programmer/Developer
- Web Designer
- Data analysts
- System Analyst
- Network Engineer
- IT consultant

- QA analyst
- Project manager
- Technical sales representative

**Table 15.1 List of IT companies in India and job profile**

<b>Sr. No.</b>	<b>Name of Company</b>	<b>Website</b>	<b>Job Profile</b>
1.	Tata Consultancy Services	<a href="http://www.tcs.com">www.tcs.com</a>	Assistant System Engineer
2.	Infosys Technologies	<a href="http://www.infosys.com">www.infosys.com</a>	Graduate Trainee Engineer
3.	Wipro	<a href="http://www.wipro.com">www.wipro.com</a>	Software Engineer
4.	Hewlett- Packard India	<a href="http://www.hp.com">www.hp.com</a>	Trainee Engineer
5.	Cognizant Technology Solutions	<a href="http://www.cognizant.com/india">www.cognizant.com/india</a>	Graduate Trainee Engineer
6.	IBM India	<a href="http://www.ibm.com/in/en/">www.ibm.com/in/en/</a>	Software Engineer
7.	HCL Technologies	<a href="http://www.hcl.in">www.hcl.in</a>	Graduate Trainee Engineer
8.	Tech Mahindra	<a href="http://www.techmahindra.com">www.techmahindra.com</a>	Graduate Trainee Engineer
9.	L&T InfoTech	<a href="http://www.lntinfotech.com">www.lntinfotech.com</a>	Junior Software Engineer
10.	Cisco Systems India	<a href="http://www.cisco.com.in">www.cisco.com.in</a>	System Engineer
11.	Oracle India	<a href="http://www.oracle.com/in">www.oracle.com/in</a>	Junior Software Engineer
12.	Dell India	<a href="http://www.dell.co.in">www.dell.co.in</a>	Trainee Engineer
13.	Intel India	<a href="http://www.intel.in">www.intel.in</a>	
14.	Accenture India	<a href="http://www.accenture.com/in-en">www.accenture.com/in-en</a>	Graduate Trainee Engineer
15.	SAP India	<a href="http://www.global.sap.com/india/index.epx">www.global.sap.com/india/index.epx</a>	Software Engineer
16.	Microsoft India	<a href="http://www.microsoft.com/en-in">www.microsoft.com/en-in</a>	
17.	MPhasis	<a href="http://www.mphasis.com">www.mphasis.com</a>	Trainee Engineer
18.	Mahindra Satyam	<a href="http://www.techmahindra.com">www.techmahindra.com</a>	Software Engineer
19.	Redington India	<a href="http://www.redingtonindia.com">www.redingtonindia.com</a>	System Engineer
20.	Cap Gemini	<a href="http://www.in.capgemini.com">www.in.capgemini.com</a>	Software Engineer

# Chapter 16

## Opportunities in Power and Energy Industries

### 16.1 Introduction

The power and energy sector can broadly be classified into electricity distribution, oil and gas, renewable energy, energy management and coal. The power industry is responsible for the production and delivery of electrical energy in sufficient quantities via a power grid. Given the electricity demand is uniform across all domestic, industrial and commercial operations, power is viewed as a public utility and basic infrastructure.

India is the world's fifth-largest electricity producer after the U.S., China, Japan, and Russia, but its per capita consumption is among the world's lowest, at 778.71 kilowatt-hours a year. Power is one of the most vital inputs to the socio-economic development of the country. The projected growth of the Indian economy largely depends upon the performance and growth of the power sector. As estimated, India needs to augment power production to 8 lakh megawatts from the current 1.6 lakh megawatts to sustain present economic growth in the next 25 years.

### 16.2 Thrust Areas

Global power utilities are quietly firming up plans for the vast Indian market and have posted ex-pats to hunt for opportunities, including M & A deals, in the sector where local companies are pleading for government support to battle rising costs, fuel scarcity and inefficient distribution networks.

- Increasing energy efficiency in industry, vehicles, and appliances
- Accelerating the transformation of its power sector
- Adoption of clean technology
- Building green infrastructure for urban habitats and transportation
- Establishing sustainable agriculture and forestry practices

### 16.3 Employment Opportunities

The Government of India has declared the energy sector as a major sector to ensure the growth of the industrial sector. According to the Union Budget 2020, the energy sector will be able to generate about Rs. 22,000 crore has been allocated. The investment will continue to grow over the years, given the growing population, increasing electrification and per capita electricity consumption by 2030. Because of global warming and carbon emissions, only the non-conventional energy sector will have to pay Rs. An additional investment of Rs 8,000 crore has been made. The same investment will be in the range of Rs. The project will be taken up to 25000 crores, and 500 Giga Watts's power plants will be built. The financial system has also been set up for installing solar panels on land owned by railway tracks and installing 1 lakh new solar pumps connected to the electricity grid in agriculture. In fact, given the total power generation capacity in India, the existing power generation is only one-fourth. Though the Central Government is focusing on power generation using unconventional energy sources, it will not neglect existing and existing oil and coal power plants. Therefore, a large amount of investment



will be made to increase the efficiency of those projects. It will improve the electrical infrastructure of these power plants. At the same time, surveys are underway on all the water resources where hydropower projects can be set up. In short, all these financial provisions and proposed works, in the public and private sectors, e.g. Power-grid, BHEL, NTPC, Tata Power, etc. will open new job opportunities to the engineers.

There are two categories of jobs in energy: investment jobs (manufacturing, construction, and installation) and operating jobs. The rapidly expanding power sector tenders abundant opportunities for qualified, talented, capable and young graduates and postgraduates with diversified backgrounds like engineering, commerce, finance, accounts, human resource, law and logistics, etc. To fulfill targets of 20,000 MW of installed capacity under the National Solar Mission, the Indian solar energy industry will need an estimated 163 lakh people by 2022 across domains, profiles and levels. There has been a huge increase in demand for skilled and trained manpower from these players in the various departments

- Research & Development
- Testing Department
- Marketing
- Production

The profiles range from project head, engineering, procurement and construction (EPC) head, project directors, GM operations/project, senior manager projects, managing projects, purchase manager, solar engineer, assistant technical manager, assistant procurement manager to manager purchase, power planning manager, power resource management, manager operations. The list of various power and energies industries is given in Table 16.1.

**Table 16.1 List of power and energy industries**

Sr. No	Name of Company	Website
1.	ABB India Ltd.	<a href="http://www.new.abb.com">www.new.abb.com</a>
2.	Bharat Heavy Electrical Limited	<a href="http://www.bhel.com">www.bhel.com</a>
3.	Siemens Ltd.	<a href="http://www.new.siemens.com/in/en.html">www.new.siemens.com/in/en.html</a>
4.	GE India	<a href="http://www.ge-energy.com">www.ge-energy.com</a>
5.	Power Grid Corporation of India	<a href="http://www.powergridindia.com">www.powergridindia.com</a>
6.	NTPC	<a href="http://www.ntpc.co.in">www.ntpc.co.in</a>
7.	NHPC	<a href="http://www.nhpcindia.com">www.nhpcindia.com</a>
8.	NPCIL	<a href="http://www.npcil.nic.in">www.npcil.nic.in</a>
9.	Bajaj Energy	<a href="http://www.bajajenergy.com">www.bajajenergy.com</a>
10.	L&T Power Development	<a href="http://www.larsentoubro.com">www.larsentoubro.com</a>
11.	EDRA	<a href="http://www.erda.org">www.erda.org</a>
12.	Areva	<a href="http://www.areva.com">www.areva.com</a>
13.	Control & Switchgear Group	<a href="http://www.cselectric.co.in">www.cselectric.co.in</a>
14.	Kirloskar Electric Co. Ltd	<a href="http://www.kirloskar-electric.com">www.kirloskar-electric.com</a>
15.	Honeywell	<a href="http://www.honeywell.com/Worldwide/Pages/india">www.honeywell.com/Worldwide/Pages/india</a>
16.	Suzlon Energy	<a href="http://www.suzlon.com">www.suzlon.com</a>
17.	Enercon	<a href="http://www.enercon.de/en-">www.enercon.de/en-</a>

18.	Allen Bradley	<a href="http://www.ab.rockwellautomation.com">www.ab.rockwellautomation.com</a>
19.	Wipro Lighting	<a href="http://www.wiprolighting.com">www.wiprolighting.com</a>
20.	Moser Baer Solar Ltd	<a href="http://www.moserbaersolar.com">www.moserbaersolar.com</a>
21.	ONGC	<a href="http://www.ongcindia.com">www.ongcindia.com</a>
22.	Voltamp Transformers Ltd.	<a href="http://www.voltamptransformers.com">www.voltamptransformers.com</a>
23.	EPCOS India Pvt. Ltd	<a href="http://www.epcos.com">www.epcos.com</a>
24.	MSEB	<a href="http://www.msebindia.com">www.msebindia.com</a>
25.	BESCOM	<a href="http://www.bescom.org">www.bescom.org</a>
26.	APGENCO	<a href="http://www.apgenco.gov.in">www.apgenco.gov.in</a>
27.	Reliance Energy	<a href="http://www.rel.co.in/HTML/index.html">www.rel.co.in/HTML/index.html</a>
28.	TATA Power	<a href="http://www.tatapower.com">www.tatapower.com</a>
29.	Damodar Vally Corporation	<a href="http://www.dvcindia.org">www.dvcindia.org</a>
30.	Bharat Bijlie	<a href="http://www.bharatbijlee.com">www.bharatbijlee.com</a>
31.	Adani Power	<a href="http://www.adanipower.com">www.adanipower.com</a>
32.	Lanco Infratech	<a href="http://www.lancogroup.com">www.lancogroup.com</a>
33.	Torrent Power	<a href="http://www.torrentpower.com">www.torrentpower.com</a>
34.	Kalpataru Power Transmission	<a href="http://www.kalpatarupower.com">www.kalpatarupower.com</a>
35.	SJVN	<a href="http://www.sjvn.nic.in">www.sjvn.nic.in</a>
36.	Cummins	<a href="http://www.cumminsindia.com">www.cumminsindia.com</a>
37.	Mitsubishi Electric Pvt. Ltd.	<a href="http://www.mitsubishielectric.com">www.mitsubishielectric.com</a>
38.	Wartsila India Ltd.	<a href="http://www.wartsila.com/en_IN/Home">www.wartsila.com/en_IN/Home</a>
39.	GAIL	<a href="http://www.gail.nic.in">www.gail.nic.in</a>
40.	Megger India Pvt. Ltd.	<a href="http://www.megger.com/in/index.php">www.megger.com/in/index.php</a>
41.	DuPont	<a href="http://www.dupont.co.in">www.dupont.co.in</a>
42.	Kelvin Electrical	<a href="http://www.kelvin-electrical.com/home.html">www.kelvin-electrical.com/home.html</a>
43.	Anchor Electrical Pvt. Ltd.	<a href="http://www.anchor-world.com">www.anchor-world.com</a>
44.	Jyoti Ltd	<a href="http://www.jyoti.com">www.jyoti.com</a>
45.	Dev Donso Power Ltd	<a href="http://www.devdenso.com">www.devdenso.com</a>
46.	Adani Green Energy	<a href="http://www.adanigreenenergy.com">www.adanigreenenergy.com</a>
47.	CESC	<a href="http://www.cesc.co.in">www.cesc.co.in</a>
48.	JSW ENERGY	<a href="http://www.jsw.in/energy">www.jsw.in/energy</a>
49.	Ratan India Power Ltd.	<a href="http://www.rattanindia.com">www.rattanindia.com</a>

# Chapter 17

## Entrepreneurship Development

### 17.1 Introduction

Entrepreneurship is the act of building a business by an individual through innovation or the taking of an initiative beyond the scope of described job duties. In the business world and the field of engineering, this requires a combination of skill, intelligence, and ambition. With start-ups becoming commonplace in today's market, an individual's ability to think entrepreneurial can play even more of a role in determining success than technical ability. Organizations providing Entrepreneurship Development Programs are given below.

#### 17.1.1 National Institute for Entrepreneurship and Small Business Development (NIESBUD)

NIESBUD is an apex Institute in the area of Entrepreneurship and Small Business Development under the Ministry of Micro, Small and Medium Enterprises Government of India. The basic objectives for which the Institute has been established are Promotion and Development of Micro, Small and Medium Enterprises including Enhancement of their Competitiveness through various activities. The Institute has conducted a total of 8619 training programmes covering 2,25,076 participants which includes more than 150 international training programmes with 2,500 participants from more than 125 countries till 30<sup>th</sup> November 2013

##### Address Details:

A-23, Sector-62, Institutional Area Noida - 201309, NCR of Delhi, U.P, India Address, Regional Office, Dehradun

D/98, Defence Colony, Dehradun- 248001, Uttarakhand, India

<http://niesbud.nic.in/contact.html>

#### 17.1.2 Micro, Small & Medium Enterprises-Development Institute (MSME-DI)

Micro, Small & Medium Enterprises-Development Institute (MSME-DI), Ministry of MSME, Govt. of India, has been playing a key role for the development of MSME through counseling, consultancy and training. Established in 1960 as Small Industries Service Institute Extension Centre and thereafter upgraded as Small Industries Service Institute in 1975, the Institute has made significant contributions for the promotion and development of Micro, Small and Medium Enterprises in Jharkhand. The Institute strives to achieve its avowed objective through a gamut of operations ranging from training, consultancy, and buyer-seller meet, vendor development programme as well as various awareness and modernization programs. Recently review of more than 400 old customers duty exemptions are done this year. Rationalizing exemptions on import of duty-free items as an incentive to exporters of garments, leather and handicraft items. Most of these are manufactured by MSME's. To further reduce compliance burden, limit increased for tax audit from its Rs. 5 crore to Rs. 10 Crore.

**Address Details:**

MSME Development Institute,  
Ministry of MSME, Government of India,  
Kurla Andheri Road, Sakinaka, Mumbai-400072, MAHARASHTRA, India  
Tel: 91-22-28576090 / 28573091 / 28574305, Fax: 91-22-28578092  
Email: dcdi-mumbai@dcmsme.gov.in  
Ministry of Micro, Small & Medium Enterprises (msme.gov.in)

**17.1.3 Small Industries Development Organization (SIDO)**

Small Industries Development Organization (SIDO) an apex body at Central level for formulating policy for the development of Small Scale Industries in the country, is headed by the Additional Secretary & Development Commissioner (Small Scale Industries) under Ministry of Small Scale Industries Govt. of India.

**Address Details:**

Sh. Suresh Chandra, IAS  
Additional Secretary and Development Commissioner (SSI)  
Small Industries Development Organisation  
Ministry of Small Scale Industries.  
Nirman Bhawan, 7th Floor, New Delhi-10011  
Ph.Nos. 011-3018315 (direct)  
011-3022220, 3022221, 3022211, 3022212, 3022209, 3022202 (EPABX)  
Fax. 011-3018315, 3017322  
<http://www.msmedihimachal.nic.in/sido.html>

**17.1.4 National Small Industries Corporation (NSIC)**

Corporate Office National Small Industries Corporation Limited. New schemes are added including Raw Material Assistance, B2B Portal, Incubation Center, and Single Point Registration. The Hub will provide professional support to Scheduled Caste and Scheduled Tribe entrepreneurs to fulfill the obligations under the Central Government procurement policy Order 2012 adopt applicable business practices and leverage the Stand-up India initiative. NSIC registers Micro & Small Enterprises (MSEs) under the Single Point Registration scheme (SPRS) for participation in Government Purchases through Marketing Development Centre.

(A Government of India Enterprise)

NSIC Bhawan,  
Okhla Industrial Estate,  
New Delhi – 110 020, India  
Tele: +91-11-26926275, 26926370  
Fax: +91-11-26932075  
<https://nsic.co.in/>

**17.1.5 Entrepreneurship Development Institute of India (EDII)**

The Entrepreneurship Development Institute of India (EDI), an autonomous body and not-for-profit institution, set up in 1983, is sponsored by apex financial institutions, namely the IDBI Bank Ltd, IFCI Ltd. ICICI Ltd and State Bank of India (SBI). The Institute is

registered under the Societies Registration Act 1860 and the Public Trust Act 1950. The Government of Gujarat pledged twenty-three acres of land on which stands the majestic and sprawling EDI campus. Department at EDII includes Entrepreneurship Education, Policy Advocacy, Knowledge & Research, Projects, Business Development Services & National Outreach, Developing Economy Engagement.

**Address Details:**

(Via Ahmedabad Airport & Indira Bridge),  
P.O. Bhat 382 428, Dist. Gandhinagar,  
Gujarat, India.

<http://www.ediindia.org/ContectUs.asp>

## **17.2 Entrepreneurship Ideas**

Various ideas for entrepreneurship for engineers are mentioned below.

- Opening training institute
- Product development
- Vendor to industry
- Consultant
- Excursion rental administration
- Savvy gadget fix
- Site flipping
- Guided visits
- Online networking the executives
- Advertisement the executives organization
- Web optimization and web improvement

# Chapter 18

## Start-ups and Government Schemes

### 18.1 Introduction

A startup is a business structure powered by disruptive innovation, created to solve a problem by delivering a new product or service under conditions of extreme uncertainty. Many entrepreneurs and renowned business magnates define a startup as a culture and a mentality of building a business upon an innovative idea to solve critical pain points.

A startup is a company designed to grow fast. Being newly founded does not in itself make a company a startup. Nor is it necessary for a startup to work on technology, or take venture funding, or have some sort of “exit.” The only essential thing is growth. Everything else we associate with startups follows from growth. Therefore, the key points to note while categorizing a business as a startup are:

**Growth:** One thing that differentiates startups from other businesses is the relationship between their product and its demand. Startups have products that target a largely untapped market. Startup entrepreneurs know the perfect strategy to create a product what the market wants and to reach and serve all of them. This triggers fast growth.

**Business Structure:** A startup is a registered business entity. Any unregistered entity is just a work in progress or just an idea. A startup has an organizational structure no matter how horizontal it may be, has employees on payrolls, and have shares divided among shareholders.

**Disruptive Innovation:** A new business is considered as a startup if, through its product or service, it uncovers a new source of utility for its customers. Nevertheless, disruptive innovation is not limited to the product or service offered. Many startups do not innovate in the product dimension at all, but them:

- Provide an existing product through different innovative channels (e.g. e-commerce)
- Devise a similar business model with added value
- Become an aggregator of existing products and services
- Target new markets with existing products or services

**Uncertainty:** Innovation is a risky process. Many internal and external factors affect the fate of the startup. Since most startups do not build their business model on existing market demand, their survival, in the long run, is uncertain.

**Problem Solving:** The context on which innovation happens is what separates a startup from a small business. The problem can be existing or can be induced. Remember how the demand for packaged drinking water was created by convincing people about the dangers of drinking regular tap water?

The best way to determine if a company is a startup is to compare it with those who are not. That being said, we have come up with a pragmatic approach to categorize a business as ‘**not a startup**’. The categories include:

**Business Model:** Startups are known to have unconventional and unripe business models. The demand for their product is still at a nascent stage, making their business model a work in progress where there is still scope for many new revenue streams. There are many new companies that start-up with copied business models or as a franchise. These companies are not categorized as startups.

**Product Stage:** The product or service the startup deals in is still in the introduction or nascent stage of its life cycle. Many new companies procure or deal with some existing products in the market. These companies are not considered startups unless they innovate in other channels of the business.

**Employee count:** A startup usually does not have more than 100 employees. But this aspect cannot be used solely to categorize a business as a startup.

**Business age:** This is one of the most debated characteristics of a startup. According to the Indian government, if a company is in business for more than 5 years, it is not a startup anymore.

**Revenue:** A startup is not a startup anymore if it has reached a point where its turnover is more than \$50 million.

A startup is a young company founded by one or more entrepreneurs to develop a unique product or service and bring it to market. By its nature, the typical startup tends to be a shoestring operation, with initial funding from the founders or their friends and families.

### **Understanding Startups**

In the early stages, startup companies have little or no revenue coming in. They have an idea that they have to develop, test, and market. That takes considerable money, and startup owners have several potential sources to tap:

- Traditional funding sources include small business loans from banks or credit unions, government-sponsored Small Business Administration loans from local banks and grants made by nonprofit organizations and state governments.
- So-called incubators, often associated with business schools and other nonprofits, provide mentoring, office space, and seed funding to startups.
- Venture capitalists and angel investors actively seek out promising startups to bankroll in return for a stake in the company once it gets off the ground.

### **Valuing Startups**

Startups have no history and less profit to show. That makes investing in them risky. If an idea seems to have merit, potential investors may use any of several approaches to estimate how much money it could take to get it off the ground.

- The cost to duplicate approach looks at the expenses the company has already incurred to develop its product or service and purchase physical assets. This valuation method doesn't consider the company's future potential or intangible assets.

- The market approach considers the acquisition costs of similar companies in the recent past. This approach may be stymied if the startup idea is unique.
- The discounted cash flow approach looks at the company's expected future cash flow. This approach is highly subjective.
- The development stage approach assigns a higher range of potential value to a startup that is more fully developed. Even if it's not profitable, a startup that has a website and can show some sales and traffic is likely to get a higher valuation than one that merely has an interesting idea.

Because startups have a high failure rate, would-be investors consider the management team's experience as well as the idea. Even angel investors do not invest money they cannot afford to lose.

## 18.2 Startup India

**Startup India** is an initiative of the Government of India. The campaign was first announced by the Indian Prime Minister during his 15 August 2015.

The action plan for this initiative is focusing on three areas:

1. Simplification and Handholding.
2. Funding Support and Incentives.
3. Industry-Academia Partnership and Incubation.

An additional area relating to this initiative is to discard restrictive States Government policies within this domain, such as License Raj, Land Permissions, Foreign Investment Proposals, and Environmental Clearances. It was organized by The Department for the promotion of industry and internal trade (DPI&IT).

A startup is defined as an entity that is headquartered in India, which was opened less than 10 years ago and has an annual turnover of fewer than ₹100 crores (US\$14 million). Under this initiative, the government has already launched the I-MADE program, to help Indian entrepreneurs build 10 lakh (1 million) mobile app start-ups, and the MUDRA Bank's scheme (Pradhan Mantri Mudra Yojana), an initiative that aims to provide micro-finance, low-interest rate loans to entrepreneurs from low socioeconomic backgrounds. The initial capital of ₹20,000 crores (equivalent to ₹230 billion or US\$3.2 billion in 2019) has been allocated for this scheme.

### Key Points

- 10,000 crore start-up funding pool.
- Reduction in patent registration fees.
- Improved Bankruptcy Code, to ensure a 90-day exit window.
- Freedom from inspections for the first 3 years of operation.
- Freedom from Capital Gain Tax for the first 3 years of operation.
- Freedom from tax for the first 3 years of operation.
- Self-certification compliance.
- Created an Innovation hub, under the Atal Innovation Mission.
- To target 5 lakh schools, and involve 10 lakh children in innovation-related programmes.
- New schemes to provide IPR protection to startup firms.
- Built Startup Oasis as Rajasthan Incubation Center.



### 18. 2.1 Schemes

There are several government schemes planned by Startup India under various departments which are coordinated through various ministries.

#### [1] High Risk -High Reward Research

Science and Engineering Research Board (SERB) under Department of Science & Technology

High Risk and High Reward Research is a scheme supporting and inviting new proposals and ideas expected to have a paradigm-shifting influence on Science and Technology.

#### Eligibility:

- The applicant should be an Indian citizen residing in India.
- The applicant(s) must hold a regular academic/research position in a recognized institution.
- The proposals can be submitted by an individual or by a team of investigators. Proposals submitted by a team of investigators must identify a Principal Investigator, who will spearhead the research objectives and administer the grant.

**Website:**<https://www.startupindia.gov.in/content/sih/en/government-schemes/high-risk-high-reward.html>.

#### [2] Support for International Patent Protection in Electronics and & Information Technology (SIP-EIT), Ministry of Electronics & Information Technology

SIP-EIT is a scheme to provide financial support to MSMEs and Technology Start-up units for international patent filing to encourage innovation and recognize the value and capabilities of global IP along with capturing growth opportunities in the ICTE sector.

#### Eligibility:

- The Applicant should be registered under the MSME Development Act 2006 of the Government of India as amended from time to time as an MSME unit as per the criteria for such registration(the applicant would be required to furnish the proof of such registration).
- The applicant should be a registered company under the Companies Act of Government of India and should fulfill the investment limits in plant and machinery or equipment as defined in the MSME Development Act 2006 of Government of India as amended from time to time (this criterion will be ascertained from the proof of such registration and last audited balance sheet of the applicant).
- The applicant should be a registered STP Unit and should fulfill the investment limits in plant and machinery or equipment as defined in the MSME Development Act 2006 of the Government of India as amended from time to time(this criterion will be ascertained from the proof of such registration and last audited balance sheet of the applicant).
- The applicant should be a technology incubation enterprise or a start-up located in an incubation center/ park and registered as a company (a certification from the incubation

center/ park, in this case, is mandatory) and should fulfil the investment limits in plant and machinery or equipment as defined in the MSME Development Act 2006 of Government of India as amended from time to time (this criterion will be ascertained from the proof of such registration and last audited balance sheet of the applicant).

**Website:** <https://www.startupindia.gov.in/content/sih/en/government-schemes/international-patent-protection-sip-eit.html>

### **[3] IREDA NCEF Refinance Scheme: Indian Renewable Energy Development Agency (IREDA)**

Indian Renewable Energy Development Agency Ltd. (IREDA) has published a revised refinance scheme under the support by The National Clean Energy Fund (NCEF) elaborating about the revival of the operations of existing biomass power & small hydropower projects affected due to unforeseen circumstances.

#### **Eligibility:**

- Scheduled commercial banks and financial institutions would be eligible for refinancing from IREDA under this Scheme. Grant of refinancing shall be at the sole discretion of IREDA who would also determine the availability and extent of refinancing. The scheduled commercial banks / financial institutions shall be required to satisfy, inter alia, the following parameters to be eligible for availing refinance under the Scheme:
- They should be profit-making for the last three years and should have no accumulated losses.
- Gross Non-Performing Assets as a percentage of Gross Advances should normally not exceed five percent for the entire portfolio of the lending institution. The condition will not apply to State/ Central PSU Banks/Govt. NBFC's/ Govt. FIs.
- The Capital Adequacy Ratio should conform to the prescribed regulatory norms.

**Website:** <https://www.startupindia.gov.in/content/sih/en/government-schemes/national-clean-energy-fund-Refinance.html>

### **[4] Technology Development Programme: Department of Science and Technology under the Ministry of Science & Technology**

Technology Development Programme (TDP) is to convert proof-of-concepts for development of pre-competitive/commercial technologies/ techniques/ processes. The commercialization of these technologies needs further assessment/incubation, which does not fall in the scope of the Technology Development Programme. Transfer of technology developed under the project to the industry should ideally be the onus of the host institutions. Proposals of incremental R&D over the existing technologies may be considered for support. Theme based concept proposals for proof of feasibility will not be considered under TSDP-DST. Only full-fledged complete proposals for the development of technology/process/product will be considered under TSDP. Projects related to the design and development of Software/IT, as required for products and processes, as a part of the technology development project shall be considered. Pure software development does not fall in the scope of the programme.

**Eligibility:**

The Project Proposals could be submitted for financial support by scientists/engineers/technologists working in academic institutions/registered societies/R&D institutions/laboratories having adequate infrastructure/facilities to carry out Technology Development work/prototype building.

**Website:** <https://www.startupindia.gov.in/content/sih/en/government-schemes/technology-development-programme.html>

**[5] Entrepreneurship Skill Development Programme (ESDP):**

Entrepreneurship promotion and development Programmes are being organized regularly to nurture the talent of youth by enlightening them on various aspects of industrial/business activity required for setting up MSEs. These Programmes are conducted for youth and other people interested to set up their own industrial/self-employment venture. Such activities are also organized in ITIs, Polytechnics and other technical institutions/business schools, where skill/talent is available to motivate them towards self-employment.

**Who can apply?**

Youth and other people interested to set up their own industrial/business/self-employment venture. The qualification of the participants and the structure of the fees will be decided by the Implementing Agencies. The age of the participants will be 18 years and above.

**Website:** <https://msme.gov.in/entrepreneurship-and-skill-development-programs>

**18.3 Make in India**

The Make in India initiative was launched in September 2014 as part of a wider set of nation-building initiatives. Devised to transform India into a global design and manufacturing hub, Make in India was a timely response to a critical situation. By 2013, the much-hyped emerging markets bubble had burst, and India's growth rate had fallen to its lowest level in a decade. The promise of the BRICS nations (Brazil, Russia, India, China, and South Africa) had faded, and India was tagged as one of the so-called 'Fragile Five'. Global investors debated whether the world's largest democracy was a risk or an opportunity. India's 1.2 billion citizens questioned whether India was too big to succeed or too big to fail. India was on the brink of severe economic failure, desperately in need of a big push. More information about it and schemes is available on the following website.

**Website:** <https://www.makeinindia.com/opportunities>

**18.4 Atal Innovation Mission**

The Atal Innovation Mission (AIM) is a flagship initiative set up by the NITI Aayog to promote innovation and entrepreneurship across the length and breadth of the country, based on a detailed study and deliberations on innovation and entrepreneurial needs of India in the years ahead.

AIM has adopted a holistic framework in the achievement of its objectives.

- Atal Tinkering Labs – to promote creative, innovative mindset in schools
- Atal Incubators – to promote entrepreneurship in universities and industry
- Atal New India Challenges and Atal Grand Challenges - to promote specific product innovations with social/economic impact
- Mentors of Change – to mentor students at ATL and AIC Incubators / Startups

**Website:**<https://aim.gov.in/overview.php>

## **18.5 Stand-Up India**

*Stand-Up India* Scheme Facilitates bank loans between 10 lakh and 1 Crore to at least one Scheduled Caste (SC) or Scheduled Tribe (ST) borrower and at least one woman borrower per bank branch for setting *up* a greenfield enterprise. The enterprise may be in manufacturing, services, or the trading sector.

**Website:**<https://www.standupmitra.in/Home/SUISchemes>

## **18.6 National Skill Development Mission**

NSDC was set up as part of a national skill development mission to fulfil the growing need in India for skilled manpower across sectors and narrow the existing gap between the demand and supply of skills. The mission of NSDC is

- Upgrade skills to international standards through significant industry involvement and develop necessary frameworks for standards, curriculum, and quality assurance.
- Enhance, support, and coordinate private sector initiatives for skill development through appropriate Public-Private Partnership ( PPP ) models; strive for significant operational and financial involvement from the private sector.
- Play the role of a ‘market-maker’ by bringing funds, particularly in sectors where market mechanisms are ineffective or missing.
- Prioritize initiatives that can have a multiplier or catalytic effect as opposed to a one-off impact.

Objectives are to contribute significantly to the overall target of skilling up of people in India, mainly by fostering private sector initiatives in skill development programmes and to provide funding.

**Website:**<https://nsdcindia.org/>

# Chapter 19

## Online Learning Platforms

### 19.1 Introduction

Online learning is the newest and most popular form of distance education. Within the past decade, it has had a major impact on postsecondary education and the trend is only increasing. Online learning is education that takes place over the Internet. It is often referred to as “e-learning” among other terms. However, online learning is just one type of “distance learning”- the umbrella term for any learning that takes place across distance and not in a traditional classroom. Distance learning has a long history and there are several types available, including:

- **Correspondence Courses:** conducted through regular mail with little interaction.
- **Tele courses:** where content is delivered via radio or television broadcast.
- **CD-ROM Courses:** where the student interacts with static computer content.
- **Online Learning:** Internet-based courses are offered synchronously and/or asynchronously.
- **Mobile Learning:** Using devices such as cellular phones, PDAs, and digital audio players (i pods, MP3 players).

### 19.2 Benefits of Online Teaching and Learning:

Online distance learning meets the needs of an ever-growing population of students who cannot or prefer not to participate in traditional classroom settings. These learners include those unable to attend traditional classes, who cannot find a particular class at their chosen institution, who live in remote locations, who work full-time and can only study at or after work, and those who simply prefer to learn independently.

The minimum requirement for students to participate in an online course is access to a computer, the Internet, and the motivation to succeed in a non-traditional classroom. Online courses provide an excellent method of course delivery unbound by time or location allowing for accessibility to instruction at anytime from anywhere. Learners find the online environment a convenient way to fit education into their busy lives. The ability to access a course from any computer with Internet access, 24 hours a day, seven days a week is a tremendous incentive for many students.

Some of the main advantages of online learning include:

- **Convenience:** 24/7 access from any online computer; accommodates busy schedules; no commuting, no searching for parking.
- **Enhanced Learning:** Research shows the increased depth of understanding and retention of course content; more meaningful discussions; emphasis on writing skills, technology skills, and life skills like time management, independence, and self-discipline.
- **Levelling of the Playing Field:** Students can take more time to think and reflect before communicating; shy students tend to thrive online; anonymity of the online environment.

- **Interaction:** Increased student-to-teacher and student-to-student interaction and discussion; a more student-centered learning environment; less passive listening and more active learning; a greater sense of connectedness, synergy.
- **Innovative Teaching:** Student-centred approaches; increased variety and creativity of learning activities; address different learning styles; changes and improvements can translate to on-ground courses as well
- **Improved Administration:** Time to examine student work more thoroughly; ability to document and record online interactions; ability to manage to grade online.
- **Savings:** Accommodate more students; increased student satisfaction = higher retention and fewer repeats.
- **Maximize Physical Resources:** Lessen demand on limited campus infrastructure; decrease congestion on campus and parking lots.
- **Outreach:** Give students options; reach new student markets; appeal to the current student's thus increasing enrollment.

List of online courses platform is given Tables 19.1.

**Table No. 19.1 Online Courses Platform**

Online Course platform	About Online Course platform	Website
edX	edX offers free subject matter from top universities, colleges and schools from around the world, including MIT and Harvard, and many courses	<a href="https://www.edx.org/">https://www.edx.org/</a>
Coursera	Coursera is a learning site offering courses (free for audit) from over 100 partners top universities from over 20 countries, as well as non-university partners	<a href="https://www.coursera.org/">https://www.coursera.org/</a>
MIT Open Courseware	Open Education Consortium launching in 2002 with the full content of 50 real MIT courses available online, and later including most of the MIT course curriculum	<a href="https://ocw.mit.edu/index.htm">https://ocw.mit.edu/index.htm</a>
Udemy	Udemy has a massive collection of online courses with a huge range of topics. Unlike many of the other learning sites, you pay for the courses individually.	<a href="https://www.udemy.com/">https://www.udemy.com/</a>
Iversity	Iversity is similar to Coursera in that it offers University level education	<a href="https://iversity.org/">https://iversity.org/</a>

LinkedIn Learning	LinkedIn Learning is a subscription-based online training site with a focus on creative and career-based skills. There are a huge number of courses available, all of which are quality controlled by LinkedIn	<a href="https://www.linkedin.com/learning/me">https://www.linkedin.com/learning/me</a>
Khan Academy	Khan Academy is an educational website aimed at providing a quality free education. The subjects and level of difficulty are modelled after the US school curriculum.	<a href="https://www.khanacademy.org/">https://www.khanacademy.org/</a>
Stanford Online	Stanford Online is a collection of free courses billed as "for anyone, anywhere, anytime" and which includes a wide array of topics that include human rights, language, writing, economics, statistics, physics, engineering, software, chemistry, and more.	<a href="https://online.stanford.edu/lagunita-learning-platform">https://online.stanford.edu/lagunita-learning-platform</a>
ALISON	ALISON has a large range of free, comprehensive classes on technology, languages, science, financial literacy, personal and soft skills, entrepreneurship, and then some	<a href="https://alison.com/">https://alison.com/</a>
Udacity	Udacity focuses on software development, offering free courses in programming, data science, and web development. The website also offers a nano degree program for individuals who want to master a skill set or pursue a full-time career in tech.	<a href="https://www.udacity.com/">https://www.udacity.com/</a>
Skillshare	Skillshare provides "bite-sized" classes to learners who only have 15 minutes a day. It has more than 500 free classes and several thousand premium classes to choose from in topics such as film, writing, tech, lifestyle, and more.	<a href="https://www.skillshare.com/">https://www.skillshare.com/</a>
FutureLearn	FutureLearn's completely free, with classes taught by universities and special organizations. Its big topics are business and management, creative arts, law, health, politics, science, digital skills, sports and leisure, and teaching.	<a href="https://www.futurelearn.com/courses">https://www.futurelearn.com/courses</a>

Schneider Electric	Energy education from anywhere Schneider electric offers energy topics, including data centers, energy and infrastructure, industry, health care, and buildings and residential.	<a href="https://www.schneideruniversities.com/">https://www.schneideruniversities.com/</a>
Internshala	Internshala is an internship and online training platform with 40000+ internships in Engineering, MBA, media, law, arts, and other streams This WordPress blog that is aggregated with internships across India and articles on education, technology and skill gap, through online training.	<a href="https://internshala.com/">https://internshala.com/</a>
SWAYAM	SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) is an integrated MOOC platform for distance education that is aimed at offering all the courses till the post-graduation level. This platform enables students to virtually attend the courses taught by the best faculty; access high-quality reading resources, participate in discussion forums; take tests and earn academic grades.”	<a href="https://swayam.gov.in/">https://swayam.gov.in/</a>
OPEN COURSEWARE CONSORTIUM	It is a vast network of hundreds of institutions worldwide, with courses in 20 languages, and all of it is free of charge. There are dozens of subjects available, with admirable attention paid to studies in science, engineering and technology.	<a href="https://www.oeglobal.org/">https://www.oeglobal.org/</a>
Engineering for Change	The E4C Online Academy features our Webinar Series including live webcasts every month allowing you to interact with some of the most compelling people working in sustainable development and technology.	<a href="https://www.engineeringforchange.org/what-we-do/professional-development/">https://www.engineeringforchange.org/what-we-do/professional-development/</a>
THE OPEN UNIVERSITY	The UK-based Open University offers more than 600 courses with training from novice to advance in 250 qualifications. Subjects include computing, technology, math and sciences among others.	<a href="http://www.open.ac.uk/">www.open.ac.uk/</a>



ACADEMIC EARTH	Academic Earth rounds up online courses from accredited universities and provides them free of charge. A reading of the first and second-to-the-last subjects might interest E4C members: They are Art & Architecture and Technology & Innovation.	<a href="https://academicearth.org/">https://academicearth.org/</a>
NPTEL	The National Programme on Technology Enhanced Learning (NPTEL) is one of the most useful online resources for anyone interested in studying. NPTEL provides E-learning through online Web and Video courses in various streams. NPTEL is a joint initiative from IITs and IISc to offer online courses & certification. Learn for free, Pay a small fee for the exam and get a certificate	<a href="https://nptel.ac.in/">https://nptel.ac.in/</a>
Codecademy	Codecademy is an e-learning platform to participate in. On its website, interested students are provided access to programming resources for 7 languages namely; Html & CSS, JavaScript, jQuery, PHP, Python, Ruby, and APIs. Courses on Codecademy are broken down into beginner, intermediary and expert levels which mean that you can start your study from any stage you choose.	<a href="https://www.codecademy.com/">https://www.codecademy.com/</a>
Class-central	Class-central is an online discovery tool that could be very useful to engineering students if well used. The idea behind this website is to help students find open online courses that match their interests to participate in. With course-central, you can find tutorial materials that suit your engineering needs from reputable colleges such as Stanford, MIT, and Harvard. Other e-learning platforms are not left out when searching via course-central for it also links you to courses on Udemy, Coursera among others.	<a href="https://www.classcentral.com/">https://www.classcentral.com/</a>

CosmoLearning	CosmoLearning has a massive collection of engineering subjects – right from Aerospace Engineering to Systems Engineering, there is a lot for everyone here in the form of video lessons.	<a href="http://www.cosmolearning.org">www.cosmolearning.org</a>
Courses.com	Courses.com offers a collection of free online courses from top educational institutions for anyone to take. Courses.com is one of the best websites where they have customized Free Courses on all the engineering subjects. Great online courses, for free. Open courses from top universities. One of the best online course websites. .	<a href="http://Free%20Online%20Electrical%20Engineering%20Courses%20Courses.com">Free Online Electrical Engineering Courses   Courses.com</a>
Open Culture	Free Engineering courses online from the world's leading universities some of the best online course sites. You can download these audio & video courses straight to your computer or mp3 player. For more online courses, visit our complete collection, 1,300 Free Online Courses from Top Universities.	<a href="http://www.openculture.com/engineering_free_courses">www.openculture.com/engineering_free_courses</a>

# Chapter 20

## Internships

### 20.1 Introduction

An internship is a professional learning experience that offers meaningful, practical work related to a student's field of study or career interest. An internship gives a student the opportunity for career exploration and development, and to learn new skills. It offers the employer the opportunity to bring new ideas and energy into the workplace, develop talent and potentially build a pipeline for future full-time employees.

A quality internship:

- Consists of a part-time or full-time work schedule that includes no more than 25% clerical or administrative duties.
- Provides a clear job/project description for the work experience.
- Orients the student to the organization, its culture, and proposed work assignment(s).
- Helps the student develop and achieve learning goals.
- Offers regular feedback to the student intern.

### 20.2 Why Are Internships Important?

An internship is a period of work experience offered by an employer to give students and graduates exposure to the working environment, often within a specific industry, which relates to their field of study. Internships can be as short as a week or as long as 12 months. They can be paid or voluntary; however, before you start an internship it's important to know your rights with regards to getting paid.

Internships can be done in a range of sectors, including sales, marketing, engineering, graphic design, management, I.T. and many, many more. Throughout an internship you will develop a variety of soft skills, including communication skills, personal effectiveness, presentation skills, creative problem solving and influencing skills. 'On-the-job' experience can be as valuable as anything learned in your studies. After all, you cannot really understand what a job is all about until you have worked in that environment. Internships are great opportunities to speak directly to people who have experience in the role you aspire to; and their knowledge of the job and working environment will give you a greater understanding of what it's all about and what you need to do to progress.

Your career aspirations may change when you're faced with the true realities of a role. Internships can therefore be used as a 'try before you buy' option, before you embark on a career and confirm if this is what you want to do in the long term.

An internship can give you a real insight into the world of work, allowing you to build on the theory you learned at university and helping you to gain practical skills that will help strengthen your CV and make you more employable. Internships offer you the chance to test your skills in real-life situations, explore your career options and gain an insight into an organization or career path.

### **20.3 Ways to Find an Internship**

#### **1. Use Campus Resources:**

If you're a student, go to your campus career center and figure out how to attend career fairs and take part in on-campus recruiting. There may also be job boards for students at your university. These employers are specifically looking for students from your school! Make the most of that university connection and take advantage of how convenient it is to have employers come to you.

#### **2. Go Online:**

As you probably guessed, there are tons of resources online too, including, of course, The Muse, which features both job and internship postings along with company profiles to help you learn about organizations and their culture.

Searching online can be really overwhelming, so it's best to go in with an idea of what you're looking for, such as a "product management internship" or "editorial internship." It's counter-intuitive, but the more you narrow your search, the more manageable it'll be. You can always stay open to other opportunities as the process unfolds but start with a clear goal.

#### **3. Look at Your Favorite Organizations:**

Everyone has a couple of dream companies. If you're not sure exactly what kind of internship you want to pursue, another direction you can go is to check out the company first. Go directly to your target company's website and see what kind of internship programs and opportunities it offers. If you find one that might be a good fit, apply! After all, a major benefit of an internship is helping you figure out what you want to do post-graduation.

## **20.4 Tips for Getting an Internship**

### **1. Start Looking Early:**

Figure out when your industry recruits. In general, the larger the company is, the earlier in the fall they probably start the process for the following summer's intern class. If your school has a fall career fair, that's a great place to begin your search.

Smaller companies have a harder time projecting headcount and therefore tend to hire closer to when they need someone to start. That could mean applications due any time between January and March for a summer internship, so make sure you check on timelines in the fall, even if you're targeting smaller organizations. If you're looking for a fall or spring internship, aim to start your search at least a full semester before your target start date.

### **2. Get Your Resume and Cover Letter in Shape:**

Follow these five steps to write a resume for an internship and read up on how to write a cover letter for an internship. (There are examples at the end of each article!) You might not feel like you have very much experience to write about, but as long as you keep an open mind about what "experience" encompasses—like course assignments, hackathons, volunteer projects, or other extracurricular activities—you'll likely be able to put together a compelling application.

### **3. Prepare for Those Interviews;**

It can be tempting to wing it, especially since interview invites can often make them sound like casual chats. Don't fall for it. Review common internship interview questions and practice answering them aloud. You don't have to memorize your responses but practice them.

Make sure you do some research about the company—what it does, what it's currently working on, and what its culture is like. If you want to be extra prepared, dig a little deeper to see what their interview practices are like and what questions they ask (if you have a contact at the organization, reach out!). Lastly, if possible, try to learn more about your specific interviewers on the company website, LinkedIn, or other professional pages. Use all of your research to come up with relevant questions to ask at the end of your interview.

#### **4. Use Your Network:**

If you're a student, reach out to professors, alumni, and your career center. Let people know what kind of internship you're looking for. They can't help unless they know what you're after. I don't mean go and ask an alum you've never met before to hand you an internship. Instead, tell them what you're interested in and ask for their advice on how to achieve it. To be even more targeted with your networking, create a list of companies you're interested in and start finding people to reach out to via LinkedIn or your college's alumni database. Apply online as well to make sure you don't miss any deadlines, but keep meeting with people and conducting informational interviews to get advice about your search. You may even find yourself in an impromptu interview and land the internship of your dreams.

Networking is often a more labor-intensive approach, but it also tends to result in a better fit than just applying randomly. Even if it doesn't directly pay off in your internship search, one day you'll be glad you started developing your network early in your career.

#### **20.5 Reasons to do an internship**

- a. Gain work experience with less pressure
- b. Network with people in the industry
- c. Build your resume
- d. Gain connections at interesting companies
- e. Develop time-management skills
- f. Learn about a job before committing to it
- g. Build confidence
- h. Earn a job

#### **20.6 Types of internships for electrical engineering students**

If you have had a chance to consult your seniors in college, you'd know that most of the electrical engineering students look to do internships in PSUs or government departments dealing with power generation and distribution.

Here is a look at some of the places you can focus on getting an internship with –

##### **I. Power Plants**

Power plants continue to be a major source of great internship experience for electrical engineering students. With the rise of the industrial era and an increase in dependency on electricity, the demand for highly efficient power generating sources has gone up. Coal, which continues to hold its position as a major source of electricity

generation is now joined by wind, solar, thermal, tidal, and other renewable energy sources. As such, these power plants are also great options for all electrical engineering internships.

## II. PSUs

Public Sector Undertakings or PSUs can also help you learn and grow. As electrical engineering students, internships in government-run organizations can be a really great deal. By interning in PSU organizations, you get the experience of working in, both, a government organization and a private organization. As such, these government undertakings are your best bet. Government-run agencies Government internships are always the most recommended ones. And rightly so, as it is not so easy to crack an internship with a government-run agency. But if you get through one, rest assure that you are up for some astounding career expedition ahead.

Some of the Government agencies you should be looking at –

- ◆ DRDO
- ◆ NitiAyog
- ◆ MISTI

Here is a list of some of the top companies in which you can look for an internship.

- ◆ NPTEL
- ◆ Tesla
- ◆ Google
- ◆ BHEL
- ◆ Volkswagen
- ◆ Volvo
- ◆ ONGC
- ◆ SAIL
- ◆ Bharat Sanchar Nigam Limited
- ◆ BSNL
- ◆ NPCL
- ◆ AAI

## **20.7 List of the best internship sites**

### **1. Internshala**

It is one of the reputed internship sites and the biggest on the web. They strive hard to provide internships to both working women as well as college students so that they gain the required skills. They allow students to choose the companies of their choice just by filtering out the locations, category, duration among other things.

<https://internshala.com/>

### **2. LinkedIn**

This huge platform that provides a way for people to find those contacts to connect. These contacts can help them in a big way by learning about the jobs or internship programs. It is quite easy to use, and you just have to create a profile including some things to keep in mind.

Keep on checking the companies for internships in your desired career and interesting location. You will also be able to apply for an internship directly on the website, in case it is difficult to pass on the platform itself.

<https://in.linkedin.com/>

### **3. AICTE**

AICTE with association with NEAT team, is giving a wonderful opportunity to students from all over the country with any academic background in finding their dream internship. Through their internship portal, where more than 300 certified and authentic companies including your dream company, regularly keep posting their requirements for interns.

<https://internship.aicte-india.org/>

### **4. Lets INTERN**

Let's INTERN is one of the leading internship websites that you should use to get the best services. This platform has been helping the students to acquire some of the finest and valuable internships from various reputed companies in India. Just as you have to simply register, similarly the companies on the other hand also have to sign up for the employer's column.

In addition to that, the website also offers internships in various domains. If you also browse through their blog section, you will find various educational content about the step-by-step process of the internship.

<https://www.letsintern.com/>

### **5. GlassDoor**

GlassDoor is one of the best internship sites in India that is preferred by both students and graduates to get top internships. Moreover, they also offer jobs and even guide you through the entire process of interview questions, reviews of the companies, etc. This



platform allows the employer as well as the student to find and hire the best for their company.

<https://www.glassdoor.co.in/index.htm>

## **6. Youth4Work**

This platform is solely for the talent in the marketplace having a user base of Millions. Although a rising platform, it strives to become the top internship site in India. Moreover, its unique method like conducting tests instead of just offering a list of internships makes it easy to categorize students.

<https://www.youth4work.com/>

## **7. HelloIntern**

Hello Intern is a renowned online internship platform that has gained the status of global expert. Moreover, this amazing site allows you to opt for various internships with both N/P organizations and IT companies alike. You can avail various opportunities that are offered by this platform ranging from several fields and working domains.

<https://www.hellointern.com/>

## **8. OysterConnect.com**

Oyster Connect is India's first and biggest Industry Student Platform aimed at developing work skills in students along with their studies. OysterConnect has a network of 4000 active Industry professionals who Provide Live Projects and Answer Career Questions of its 10,000 active students. OysterConnect posts Industry-led Live Projects given out by Industry on its platform. These Industry Led projects are real work that the Industry wants to be done immediately. Students apply to these projects via OysterConnect.

<https://www.oysterconnect.com/>

## **9. Angellist**

Angellist is one of the renowned internship sites in India that offers numerous opportunities to students all over the nation. It allows the students to apply privately to more than 130,000 technology jobs with a single application. You will find reputed organizations that post their requirements frequently on this platform.

<https://angel.co/>

**PART II: RECOMMENDATIONS RELATED WITH  
TRAINING AND PLACEMENT ACTIVITIES**

# **Chapter 1**

## **Importance of training in the career development of Engineering Undergraduate Students**

### **1.0 General**

In recent days a serious discussion on the quality of higher education in India, the international ranking of higher education institutions in India and their failure to enter the list of top 200 institutions of the world, and the low employability of Indian graduates have started all across the country. At long last, a debate has been initiated in the media on the topic and it seems that the country has started realizing that the Indian education system needs immediate serious attention. It has received further importance as the President of India has been expressing his concern in every possible forum. Several educationists have focused on the problems of poor quality primary education in India which has been brought to light through the recent NCERT and Pratham reports. The Knowledge Commission of India headed by Sam Pitroda has said that the country will need more than 1,500 universities by 2015 to provide opportunities for higher education to eligible Indian youths. Today the country has more than 700 universities and 33,000 colleges which offer a large number of programs in Arts, Science, Commerce, Finance, Engineering, Technology, Law and Medicine. The country has grown in terms of the number of colleges, universities and programs, but it seems that there is a huge gap between the quantity and quality of higher education offered in this country.

In today's knowledge-based economy where creativity, innovation are considered as important parameters in the economic development of every Nation to achieve and sustain Economic growth. Rapid technological changes and globalization have created many opportunities for Young Engineering Graduates. Despite the increase in intake capacity after the privatization of the educational sector in today's context industries are not getting good Engineering Graduates. Employability of Engineering Graduates is very poor in our country despite ample opportunities to make a career in various sectors /areas. For sustainable economic growth of the country, there is a need to focus on important parameters during the engineering program to enhance the skills of Engineering Graduate students to empower them to face challenges of globalization. In near future research and development, Intellectual property areas will provide ample opportunities for young Engineering Graduates. Thus an all-out effort is needed to produce readily- employable technical manpower in the country.

### **1.1: Reasons for Poor Placement of Engineering Graduates in Campus, Pull Campus and Off-Campus, Poor Performance in Competitive Examinations, Higher Studies**

Various reasons for poor performance in the mentioned areas are:

- The majority of Engineering Undergraduate students don't focus on which area they want to develop their careers until they come to the final year of the second semester.

- The majority of engineering students are not aware of various career opportunities available for young Engineering Graduates.
- No mechanism at the Institute level to provide career counselling for all Engineering Graduates right at Second-year First semester level.
- Students SWOT analysis to identify their strengths, weaknesses are not done at the Second Year First Semester.
- Skills sets required for successful Engineering Graduates are not identified at the Department /Institute level.
- Document on career opportunities for young Engineers is not made available to students to guide them in choosing their career.
- Training needs of students based on career opportunities are not identified.
- No focus efforts to enhance the required skills of students right from the second year. Less number of students becomes eligible due to a lower aggregate percentage from FE to the First semester of the final year.
- There is no mechanism for enforcement after training to overcome the identified weakness of students.
- No students forums based on their common career development.
- Poor placement on campus in the case of many industries leads to an increase in the reluctance of many multinational industries in the participation of campus placement drive organized by the Institute.
- No Separate institute website of training and placement with complete guidance on career development, industry-based eligibility criteria, procedure, and previous placement records, etc.
- No feedback mechanism from Training and placement cell based on areas in which student performance was poor.
- Feedback of placement is not considered as one of the important inputs for the Next batches to provide training to improve their skills to increase placement percentage.
- The focus of training and placement cell is only on placement, no focused efforts are Made by the institute to providing training of students on competitive examinations Entrance examinations for Higher studies within India and Abroad, Entrepreneurship development, IPR, skill up-gradation.
- No online registration facility is provided to students to get registered for specific career options.
- No database generation at institute level/department level based on specific career options.
- Objectives of the Training and Placement cell are not defined precisely.
- No mission and vision statement with short term, midterm, long term, and documentation of the same.
- No web-based training and placement documentation and registration.
- Basic identified reasons for poor placement in India are
  - a. Poor attitude of students: The first and foremost hurdle in any campus placement is to clear a career aptitude test.
  - b. Poor soft Skills: Soft skills have always been a hurdle for engineering students; some of them excel but maximum students lack soft skills.

- c. Poor technical knowledge: Many students are poor in technical knowledge including basics and application of Engineering in day-to-day life.
- d. Poor Preparation: Many students appear placement drives with casual approaches without preparation which sends the wrong message to the recruiters and leads to spoiling the image of the institute.
- e. Planning: Planning of interviews of placement by students is not done properly.

## 1.2: Important skills sets required to enhance employability of Engineering Undergraduate students:

**a) Transferable skills:** Transferable skills, often referred to as personal skills, are as important as technical skills when it comes to working in an engineering team.

**b) Teamwork:** How do you become a better team player? Practice. Group projects, athletics, drama clubs, student activities, youth groups, and community service activities all offer opportunities for you to work with other people. Teamwork involves communication between group members and resolving conflicts within the group as and when they arise. Suitable learning methods are practice and repetition, mentor/coach interaction, feedback.

**c) Facilitation skills:** The facilitator guides the team in achieving targets/goals assigned to the team. Thus one needs to understand how the team works and how to resolve conflicts if they arise within the team. These are categorized as interpersonal skill categories. Suitable learning methods are practice and repetition, mentor/coach interaction, feedback, extra-occupational transfer.

**d) Communications:** Being able to communicate your ideas to other people is a critical skill for any career path.

**e) Interviewing skills:** Involves interactive communication between interviewer and interviewee which relates to interpersonal skills. Set of suitable learning methods for interviewing skills are practice, repetition, mentor/coach interaction, feedback, and observations.

**f) Observational skills:** Observation involves understanding users, their activities, and their environment in an organization to make the right conclusions. It requires practical skills because it is a job-specific skill. Set of suitable learning methods for interviewing skills are practice, repetition, mentor/coach interaction, feedback, observations and copying, reflection.

**g) Presentation, writing, listening skills:** Engineering students need to be very good in terms of presentation skills to present their ideas /topics to a group of people with simplicity

**h) Critical Thinking:** Out-of-the-box thinking is required for Engineering to remain competitive in today's competitive world. Critical thinking involves asking questions, seeking out answers, comparing options, and making decisions. It is also about keeping things in perspective and learning from experience and practice.

**i) Strong technical skills:** Engineering students should have strong technical skills with a better understanding of principles, cause, and effect analysis, problem-solving abilities, creativity, and application of domain knowledge in day-to-day life.

**j) Analytical skills:** Analytical skills require job-specific knowledge and skills like design, coding, testing to write feasible requirements. Set of suitable learning methods for interviewing skills are practice, repetition, mentor/coach interaction, feedback, observations and copying, reflection, and physiological techniques.

**k) Modeling skills:** Modelling is a job-specific skill and falls under the practical skill category

**l) Interpersonal Skills:** Interpersonal Skills are the skills we use to interact and build relationships with other people. In the workplace, you will likely need to work well with a variety of different people, in different roles, at different levels of seniority and from different cultures.

**m) Personal Skills:** Personal skills are concerned with looking after your own well-being, both body and mind. These skills are the foundations for success in other areas and should not be overlooking.

Set of suitable learning methods for interviewing skills are practice and repetition, mentor/coach interaction, feedback, collaboration and feedback.

**Table 1.1: Learning methods for the requirement of Engineering Skill up-graduation**

Learning Methods	Skills						
	Interviewing	Observation	Group work	Facilitation	Analytical	Modelling	Presentation
Practice and repetition	YES	YES	YES	YES	YES	YES	YES
Reflection	-	YES	-	-	YES	YES	-
Observation and copying	YES	-	-	YES	YES	YES	-
Feedback	YES	-	YES	-	-	-	YES
Extra occupational transfer	YES	YES	-	YES	YES	-	-
Stretching activities	YES	YES	-	YES	YES	-	-
Perspective switching	YES	YES	-	YES	YES	YES	-
Mentor /coach interaction	YES	YES	YES	YES	YES	YES	YES
Physiological Techniques	-	YES	-	-	YES	YES	-
Articulation	-	-	-	-	YES	-	-
Collaboration	YES	YES	YES	YES	YES	-	YES

## References

[www.civilserviceindia.com](http://www.civilserviceindia.com)  
<http://www.upsceexam.com/>  
<http://www.upscguide.com/>  
<http://upscportal.com/civilservices/>  
<http://www.inspireignite.com/>  
<http://gateforum.com/>  
<http://www.onestopgate.com/>  
<http://www.minglebox.com/gate>  
<http://www.minglebox.com/jam-exam>  
<http://www.toeflgoanywhere.org/>  
<http://www.goodlucktoefl.com/>  
<http://www.ets.org/toefl>  
<http://www.ielts.org/>  
<http://www.ielts-exam.net/>  
<http://takeielts.britishcouncil.org/>  
<http://www.ets.org/gre>  
<http://www.minglebox.com/gre-test>  
<http://www.greguide.com/>  
<http://www.catiim.in/>  
<https://www.shiksha.com/mba/cat-exam>  
<https://www.shiksha.com/mba/cmat-exam>  
<http://www.mba.com/>  
<http://www.gmac.com/gmat.aspx>  
<http://india.gov.in/spotlight/schemes-student-scholarships-awards-and-loans>  
<http://www.topuniversities.com/university-rankings/faculty-rankings/engineering-andtechnology/2013>  
<https://www.startupindia.gov.in/>  
[Graduate Employability Skills | SkillsYouNeed](#)  
[7+ Top Educational Websites for the Engineering Students \(mituniversity.edu.in\)](#)