

Title of the Project: **Assessment of Emerging Opportunities and Prospects of Careers in Science and Technology**

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Executive Summary

- There were 236 UGC approved Universities, 101 Deemed to be Universities, 13 Institutes of National Importance and 18064 University Colleges & Affiliated Colleges out of which 17000 Colleges had the facility of science courses.
- 5612 and 5549 Ph. Ds in science were awarded during 2003-04 & 2004-05 as per Annual Reports of UGC. Percentage-wise there was not much increase in students enrolment in Science, Engineering and Technology during the three years of 2003-04, 2004-05 and 2005-06. It was nearly static at 21%.
- Noted academicians, scientists, experts and political leaders have expressed their concern about the declining interest of students in pure sciences.
- To improve the science education in schools and to generate S&T employment, the Government of India has taken a number of steps recently such as hike in educational budget, setting up of more IITs, NITs, IIITs, IISERs, Schools of Planning & Architecture, Indian Institutes of Space Science & Technology, Science Express-Science on Wheels, Scholarships & Awards, Setting up of Skill Development Centres and proposed setting up of National S&T Commission etc.
- In all 27,791 S&T vacancies were advertised in the year 2005 and 32,362 vacancies in the year 2006. The increase in S&T job opportunities in the year 2006 over the year 2005 works out to nearly 17%.
- During 2005, 3751 vacancies were advertised for **Scientists** – 2747 (73.23%) “with experience” and 1004 (26.77%) “without experience”. During 2006, 4381 vacancies were advertised for **Scientists** – 3198 (73 %) “with experience” and 1183 (27 %) “without experience”.
- Comparatively, the status of job opportunities for fresh **Scientists** in the years 2005 & 2006 shows only a marginal increase of about 0.23%.
- During 2005 & 2006, highest number of vacancies advertised for **Scientists** have been in Agriculture, Physics, Chemistry, Physics–Chemistry–Mathematics combined and Botany in both the years.
- State-wise distribution of vacancies of **Scientists** during 2005 & 2006 was in the order of Uttar Pradesh followed by Delhi, Maharashtra, Madhya Pradesh, Andhra Pradesh and other States.

- Sector-wise, the highest number of vacancies for **Scientists** were in the Central Government followed by Private Sector, State Government and Public Sector Undertakings.
- Vacancies advertised in Academic Sector for **Science Faculty** during 2005 were 964 (84.41%) “with experience” and 178 (15.59%) “without experience” category. Vacancies advertised for **Science Faculty** during 2006 were 1120 (84.46%) in “with experience” and 206 (15.54%) in “without experience” category.
- There is a marginal decrease of 0.05% in the “without experience” vacancies advertised during 2006 for **Science Faculty** over the year 2005.
- Field-wise, the highest number of vacancies advertised for **Science Faculty** in 2005 were in Agriculture, Physics, Chemistry, Microbiology and Botany. For the year 2006 though the fields are same but there is a slight change in their order that is Agriculture, Chemistry, Physics, Microbiology and Botany followed by other fields.
- State-wise distribution of vacancies of **Science Faculty** shows their order as Delhi, Maharashtra, Uttar Pradesh, Andhra Pradesh, Karanataka followed by other States for both the years.
- Distribution of vacancies in Academic Sector for **Science Faculty** for both the years was in the same order i.e. Universities followed by Deemed Universities, Colleges and Institutes.
- Vacancies advertised for **Science Teachers** during 2005 were 536 (80.48%) “with experience” and 130 (19.52 %) “without experience” category. Vacancies advertised for **Science Teachers** during 2006 were 644 (80.38%) in “with experience” and 158 (19.70%) in “without experience” category.
- There was a marginal increase of 0.18 % in “without experience” vacancies of **Science Teachers** in 2006 over the year 2005.
- Field-wise the highest number of vacancies advertised for **Science Teachers** were in Physics, Chemistry, Biology, Computer Science and Botany in both the years.
- State-wise distribution of vacancies of **Science Teachers** for both the years was in the order of Delhi, Rajasthan, Haryana, Uttar Pradesh, West Bengal and followed by other States.
- Sector-wise distribution of vacancies of **Science Teachers** shows that maximum number of vacancies were advertised by Public Schools followed by Government Schools, Kendriya Vidyalayas and Private Schools.

- Vacancies advertised for **Science Personnel** during 2005 were 354 (84.89%) “with experience” and 63 (15.11 %) “without experience” category. Vacancies advertised for **Science Personnel** during 2006 were 430 (83.66%) in “with experience” and 84 (16.34%) in “without experience” category.
- In comparison of “without experience” vacancies of **Science Personnel** for the years 2005 & 2006, the resultant increase over the previous year is 1.23 %.
- Field-wise, the vacancies of **Science Personnel** were in the order of Physics, Computer/Information & Technology and Chemistry for both the years.
- State-wise distribution of vacancies of **Science Personnel** were in order of Tamil Nadu, Maharashtra, Rajasthan, Punjab, Uttar Pradesh and followed by other States for both the years.
- Sector-wise distribution shows that vacancies of **Science Personnel** were higher in Central Government followed by Public Sector Undertakings, Engineering Institutions/Engineering Colleges, Universities/Deemed Universities and State Governments.
- 5930 vacancies of **Medical Personnel** were advertised during 2005 comprising of 3004 (50.66%) in “with experience” category and 2926 (49.34%) in “without experience” category. 6917 vacancies of **Medical Personnel** were advertised during 2006 out of which 3505 (50.67%) were “with experience” category and 3412 (49.33%) in “without experience” category.
- Comparison of data of both the years in respect of **Medical Personnel** in “without experience” category shows that there was a marginal increase of 486 vacancies in 2006 over the year 2005.
- Field-wise, in **Medical Personnel** the highest fields in order were Ayurvedic, Allopathic Medicine, Nursing, Pharmacy and Public Health in both the years.
- State-wise distribution for **Medical Personnel** for 2005 & 2006 is the same i.e. in order of Delhi, Uttar Pradesh, Maharashtra, Chandigarh, Andhra Pradesh and followed by other States.
- Sector-wise distribution of vacancies of **Medical Personnel** in order is: State Government, Central Government, Public Sector Undertakings and Private Sector.
- 12792 vacancies for **Engineers & Technologists** were advertised in 2005. Out of which, 6872 (53.72%) were in “with experience” and 5920 (46.28%) in “without experience” category. 14877 vacancies for **Engineers & Technologists** were advertised in 2006. 7901 (53.11%) were “with experience” category and 6976 (46.89%) in “without experience” category.
- There is a marginal increase of 0.61% in 2006 over the previous year status of vacancies when the data of “without experience” category of **Engineers & Technologists** is compared.

- Field-wise, for the years 2005 & 2006, there are 45 branches of **Engineering & Technology**, out of which the highest in order are Civil, Mechanical, Electronics & Communication, Electrical and Computer/IT.
- State-wise distribution of vacancies of **Engineers & Technologists** for the years 2005 & 2006 is in order of Delhi, Uttar Pradesh, Maharashtra, Madhya Pradesh and Karnataka followed by other States.
- Sector-wise distribution of vacancies of **Engineers & Technologists** during 2005 & 2006 is Private Sector, Central Government, Engineering Institutes/Engineering Colleges, State Governments and Public Sector Undertakings.
- 1218 vacancies were advertised during 2005 for **Faculty in Engineering & Technology** out of which 1052 (86.37%) were in “with experience” and 166 (13.63%) in “without experience” category. 1386 vacancies were advertised during 2006 for **Faculty in Engineering & Technology** out of which 1182 (85.28%) were in “with experience” and 204 (14.72%) in “without experience” category.
- “Without experience” category indicates an increase of 1.09% of vacancies for **Faculty in Engineering & Technology** in the year 2006 over the year 2005.
- Field-wise, the vacancies advertised for **Faculty in Engineering & Technology** in both the years were in the order of Agriculture, Computer/Information & Technology, Mechanical, Civil and Electronics.
- State-wise distribution of vacancies for **Faculty in Engineering & Technology** for the year 2005 & 2006 is in the order of Tamil Nadu, Maharashtra, Karnataka, Madhya Pradesh, Uttar Pradesh and followed by other States.
- Sector-wise distribution of vacancies for **Faculty in Engineering & Technology**, indicates that the maximum number of vacancies were in Engineering Institutes/Engineering Colleges.
- 1875 vacancies were advertised for **ITI Technicians** during 2005. Out of this 777 (41.44%) were in “with experience” category and 1098 (58.56%) in “without experience” category. 2159 vacancies of **ITI Technicians** were advertised during 2006 out of which 908 (42.06%) were in “with experience” category and 1251 (57.94%) in “without experience”.
- The increase in vacancies of **ITI Technicians** during the year 2006 is 7.04 % when compared to the data of 2005.
- Trade-wise vacancies of **ITI Technicians** which were higher than other Trades during the year 2005, are Mechanical (Motor Vehicle), Mechanical (Refrigeration & AC), Mechanic (Lift Maintenance), Mechanic (Industrial Electronics) and Information Technology. During the year 2006, the position was that Mechanical (Motor Vehicle), Mechanic (Refrigeration & A.C.), Mechanic (Diesel), Mechanic (Industrial Electronics) and Information Technology were higher than other Trades.

- Delhi is amongst the top with regard to State -wise distribution of vacancies of **ITI Technicians** followed by Rajasthan, West Bengal, Andhra Pradesh, Jharkhand and followed by other States.
- Sector-wise distribution of vacancies of **ITI Technicians** shows the order as Central Government followed by Private Sector, Public Sector Undertakings, State Governments and Engineering Institutes/Engineering Colleges in both the years.
- The assessment done on the basis of data analysed for years 2005 & 2006 shows that increase in the S & T vacancies during 2006 over the year 2005 is just 17.6%. The growth of economy remaining at the same level as at present, the generation of S & T Employment each year will hopefully remain between 15 to 18%. However, this increase would not be sufficient and steps will have to absorb the highly qualified S&T personnel coming out of the Universities, Engineering Institutes/Engineering Colleges, Colleges & Schools every year in large numbers.
- Analysis and Assessment of the data done in this report shows that the potential sectors for generation of S&T employment are Government Sector and Private Sector. Area-wise potential for generation of more S&T employment lies in Engineering Sector, Agriculture, Biotechnology, Computer/Information Technology and Medical Sciences.
- Recent steps taken by the Government of India to promote Science and Technology such as hike in educational budget, setting up of more IITs, NITs, IIITs, IISERs, Schools of Planning & Architecture, Indian Institutes of Space Science & Technology, Science Express-Science on Wheels, Scholarships & Awards, Setting up of Skill Development Centres and proposed setting up of National S&T Commission etc., would certainly improve S & T employment generation in the country. This report has assessed S&T employment growth of 17.32 %, as stated above, without taking into consideration the recent steps taken by the Government. By proper execution and monitoring of the recent steps and expansion of industry, industrial and economic growth, it is estimated that S&T employment can be generated to the extent of at least 5 to 6 lakhs during the period 2007-2012 starting with a growth rate of about 35-40 % in 2007 to about 80 % in the year 2012.

Valuable information for the benefit of S&T students such as Choice of a Career, Career Options, Campus Placements, Entrance & Competitive Examinations, Talent-Fellowships-Scholarships-Studentship Schemes, S&T Entrepreneurship Development, Industrial Training Institutes (ITIs), Institutes of Higher Learning and Websites has been included in this report.