INDIAN STATISTICAL INSTITUTE

PROSPECTUS
FOR THE YEAR 2007-2008

203 BARRACKPORE TRUNK ROAD
KOLKATA 700 108

Contents

INDIAN STATISTICAL INSTITUTE

1 Introduction

The Indian Statistical Institute (I.S.I.), founded by Professor Prasanta Chandra Mahalanobis, grew out of the Statistical Laboratory set up by him in the Presidency College in Kolkata. In 1932 the Institute was registered as a non-profit making learned society for the advancement of statistics in India. Within a few years the Institute's achievements in research that included innovative projects on sample surveys of agricultural crops and socio-economic after-effects of the Bengal famine (1943-44) as well as pathbreaking research publications of Professor R.C. Bose on experimental designs in the Annals of Eugenics (1939) brought recognition in India and abroad. The Institute is now considered as one of the foremost centres in the world for training and research in statistics and the related sciences. Under the leadership of Professor P. C. Mahalanobis, the Institute also initiated and promoted the interaction of statistics with natural and social sciences to unfold the role of statistics as a key technology which explicated the twin aspects of statistics - its general applicability and its dependence on other disciplines for its own development. In keeping with this long tradition, the Institute has been engaged in developing statistical theory and methods and their practical applications in various branches of science and technology.

The major objectives of the Institute, as given in its Memorandum, are

(a) to promote the study and dissemination of knowledge of statistics, to develop statistical theory and methods, and their use in research and practical applications generally, with special reference to problems of planning of national development and social welfare;

(b) to undertake research in various fields of natural and social sciences with a view to the mutual development of statistics and these sciences;

(c) to provide for, and undertake, the collection of information, investigation, projects and operational research for purposes of planning and the improvement of efficiency of management and production.

The Institute has its headquarters in Kolkata and two major centres at Delhi and Bangalore and a branch at Giridih. In addition, the Institute has a network of units of Statistical Quality Control and Operations Research at Baroda, Chennai, Coimbatore, Hyderabad, Mumbai, Pune, apart from at Kolkata, Bangalore and Delhi.

The Institute has a distinguished faculty, as well as excellent library and modern computer facilities. A large number of Indian statisticians and probabilists who have won international fame have been scholars or faculty members at the Institute. The Institute has in its scientific staff many well-known statisticians, mathematicians, computer scientists, economists and scientists in other fields, among whom are fellows of Indian National Science Academy, Indian Academy of Sciences, Indian National Academy of Engineering, The National Academy of Sciences, India, Institute of Electrical & Electronics Engineers (IEEE), recipients of S.S. Bhatnagar Prize, G.D. Birla Award for

Scientific Research, Mahalanobis Memorial medals and fellows of many other distinguished scientific societies in India and abroad.

The Institute has acquired a special distinction in India for its activities since 1950 relating to collection and analysis of information on social, economic and demographic characteristics in India through the National sample surveys. It may be mentioned that in 1954, Pandit Jawaharlal Nehru, the first Prime Minister of India, entrusted Professor Mahalanobis and the Institute with the responsibility of preparation of the Draft Second Five year Plan of the country. This draft and the planning models formulated by the Institute under the guidance of Professor Mahalanobis have since been regarded as major contributions to economic planning in India. During these years eminent economists like Oscar Lange, Joan Robinson. Charles Bettleheim, Jan Tinbergen, Nicholas Kaldor, Simon Kuznets, many of whom were Nobel laureates visited the Institute and interacted with Professor Mahalanobis. Professors Amartya K.Sen, Sukhamoy Chakravorty and Pitambar Panth, then promising economists, participated in this fruitful interactive process.

The research done in the Institute, beginning with the work of Professor P.C. Mahalanobis, Professor R.C. Bose, Professor S.N. Roy and Professor C.R. Rao, has won the Institute a unique place in the world of statistics. Sankhya, the Indian Journal of Statistics, published by the Institute since 1933, carried much of their work in its early issues and has grown into a leading journal in statistics.

Professor P.C. Mahalanobis, while remaining at the helm of affairs as the Honorary Secretary and Director of the Institute till his sad demise in June 1972, entrusted Professor C. R. Rao to shoulder the crucial responsibility of the Director of the then RTS (Research & Training School) within the Institute. Professor C.R. Rao also discharged the pivotal duties of the Director of the Institute from July 1972 till his retirement and later became the first Jawaharlal Nehru Professor of the Institute and continues to be associated with the Institute.

The Institute has a long tradition of collaborating with eminent statisticians, mathematicians and other scientists from all over the world and having their active participation in its teaching and research programmes. Sir Ronald A. Fisher was a frequent visitor. Professor J.B.S. Haldane joined the Institute in the late fifties and worked in the Institute for several years. Other well-known scientists, some of whom were Nobel Laureates, also visited the Institute. These luminaries included Frederic and Irene Julio Curie, Neils Bohr, FrankYates, A.N. Kolmogorov, P.M.S. Blackett, Jerzy Neyman, Norbert Wiener, J.D. Bernal and Harold Hotelling.

The Institute has been offering formal courses in statistics leading to certificates and diplomas since the late thirties. Teaching in the Institute took shape in response to the research needs of the Institute from the days of its inception. During 1950s the interdisciplinary nature of teaching in the Institute was evolved through the guidance of stalwarts such as Sir Ronald A. Fisher, Professor P.C. Mahalanobis and Professor J.B.S. Haldane, with the encouragement of Professor Satyendra Nath Bose who was the President of the Institute for a long time. Post-M.Sc. advanced course in statistics was started in the late forties. In 1959, in recognition of the role of statistics as a key technology of the modern times and the importance of the Institute in the development

and application of statistics, the Parliament of India enacted the Indian Statistical Institute Act, declaring it an Institution of National Importance and empowering it to grant degrees and diplomas in statistics. The Indian Statistical Institute Act was amended in 1995 empowering it to grant degrees and diplomas in statistics, mathematics, quantitative economics, computer science and such other subjects related to statistics as may be determined by the Institute from time to time. The B.Stat.(Hons.) and the M.Stat. degree programmes in statistics were introduced in the Institute in the year 1960 with the philosophy that the academic training of a statistician should encompass the basic principles of statistics along with its theoretical and methodological development, not merely in abstract formulation, but also in relation to concrete problems arising from natural and social sciences. The curricula for these degree programmes were developed accordingly. The Institute also introduced research programmes leading to the award of Ph.D. degrees from the Institute. The Diploma in computer science was started in the Institute in 1966 and upgraded to the M.Tech.(CS) degree in 1978. In 1981 the Institute offered the first M.Tech. course in computer science in India.

In the early fifties the Institute initiated the use of Statistical Quality Control and Operations Research (SQC & OR) in India by organizing a visit of Professor W. A. Shewart in 1948 and later by inviting other eminent experts like Dr. W.E. Deming and Dr. Genichi Taguchi. The SQC promotional work gradually began to spread all over the industrial centres in India under a comprehensive programme covering education, theoretical and applied research, practical training in industry and consultation work. The Institute is regarded as the pioneer of the scientific quality control movement in India. It is also credited with introducing in India, the first of its kind, a formal Post Graduate Diploma course in SQC and OR in sixties which was upgraded to M.Tech. degree course in Quality, Reliability and Operations Research in 1989. At present, the SQC and OR division of the Institute has a network of SQC and OR units engaged in guiding the industries, located within and outside India, in developing the most up-to-date quality management (ISO 9000, QS 9000, TQM, Six Sigma etc.) systems and solving critical problems of quality, reliability and productivity.

Some of the new degree courses that have been introduced by the Institute in recent years are : (i) Master of Science degree in quantitative economics [M.S.(QE)] introduced in 1996, (ii) Bachelor degree in mathematics (Honours) [B.Math.(Hons.)] introduced in 2000 and (iii) Master degree in mathematics [M.Math.] introduced in 2003. The Institute also has been offering a course leading to Associateship in Documentation and Information Science at the Bangalore Centre since 1965.

The International Statistical Education Centre, established in the Institute in 1950, is run in collaboration with the International Statistical Institute under the auspices of the UNESCO and the Government of India. This Centre has been providing training in Statistics to sponsored students mainly from Asia, Africa and the Far East. The Centre also offers various short-term courses in statistics.

The Institute has a long history of the use of computers and, since the early fifties, has made use of successively newer generation equipments. The Electronic Computer Laboratory of the Institute was established in 1950. The first electronic computer in India, an HEC-2M, was installed in the Institute in 1956, and one of the foremost formal courses for computer science in the country started in the Institute in 1962. In 1961 the Institute, in collaboration with the Jadavpur University, undertook the design,

development and fabrication of a fully transistorized digital computer, called ISIJU-1, which was commissioned in 1966. At present, the computing facility in the Institute includes different state of the art computer systems. In addition to PCs with internet connectivity there are high end servers from leading manufacturers like SUN, IBM, DIGITAL, etc. in all the campuses (Kolkata, Delhi, Bangalore) of the Institute. The practical classes of the degree programmes have been designed to make use of computers and software packages.

The Central Library of the Institute is located at Kolkata with a network extending to two major libraries at Delhi and Bangalore Centres and other locations of the Institute. Since the inception of the Institute on 17 December 1931, the Central Library has been playing a pivotal role and over the years, it has attained the distinction of having one of the richest collections in the country particularly in the fields of statistics and the related disciplines, viz. Computer Science & Electronics, Earth Science, Economics, Life Science, Mathematics and Physics, Quality Control, etc.. At present, the Library has a total volume of more than 3.00 lakhs comprising of books, bound journals, official reports/data-books, dissertations & thesis, reprints, non-print materials such as CDs/floppies, microfilms and microfiches. As the Central Library is fully computerized library, it maintains on line access to journals & data bases viz. ACM, CIS, DMJ, EconLit, IEL, INDEST, JSTOR, Mathsci Net, ScienceDirect of Elsevier & Associates and SpringerLink. The library has developed a separate collection known as NBHM collection funded by National Board for Higher Mathematics, Department of Atomic Energy, Govt. of India. The division is making endeavours to create Institutional respositories using open source softwares facilitating access to indigenous resources across regions and increasing the visibility of such resources.

Most of the research and teaching of the Institute takes place in three campuses located in Kolkata, Delhi and Bangalore. Each campus has hostels for students, residential quarters for the faculty and a guest house, and also recreational and medical facilities. At each of these three campuses the Institute has a sizable faculty in theoretical and applied statistics, statistical quality control and operations research, mathematics and economics. In Kolkata, where the headquarters of the Institute is located, there is also a large faculty in computer and Communication science and other branches of natural and social sciences. The Institute is engaged in significant research activity in many other disciplines, such as, population studies, physics, agricultural & ecological sciences, geology, biological anthropology, human genetics, linguistics, psychometry and sociology. Moreover, in the Bangalore Centre, there are a number of scientists working in Information Science. In all these disciplines, much emphasis is given on inter-disciplinary research and collaborative work with the statisticians of the Institute. The Institute thus conjures up a symbiosis of pure, applied and interdisciplinary research involving various area of statistics, mathematics, quantitative economics, computer science, other natural and social sciences, statistical quality control and managerial decision making. This symbiosis has been systematically reflected in the teaching and training programmes of the Institute.

Platinum Jubilee Celebration of Indian Statistical Institute started in December, 2006 and will continue till January, 2008.

2 Current Academic Programmes

	Programme	Duration	Venue
Degree:	B. Stat. (Hons.)	3 years	Kolkata
	B. Math. (Hons.)	3 years	Bangalore
	M. Stat.	2 years	Kolkata, Delhi
	M. Math.	2 years	Bangalore
	M. S. in Quantitative Economics	2 years	Kolkata, Delhi
	M. Tech. in Computer Science	2 years	Kolkata
	M. Tech. in Quality, Reliability and Operations Research	2 years	Kolkata
Certificate:	Part-time Course in SQC	6 months	Bangalore, Hyderabad
Associateship :	Associateship in Documentation and Information Science (ADIS)	2 years	Bangalore
Certificate :	Intensive Course in Programming and Application of Electronic Computers*	10 weeks	Kolkata
Fellowship :	Junior/Senior Research Fellowship	5 years	Kolkata, Delhi, Bangalore
	Specialist Development Programme in SQC & OR (SDP)*	2 years	Bangalore

*For the academic year 2007-2008 these courses will be notified separately.

The Institute awards Ph.D./D.Sc. degrees for research in the fields of Statistics/Mathematics/Quantitative Economics/Computer Science.

The International Statistical Educational Centre (ISEC) of the Institute runs training programmes in collaboration with the Central Statistical Organization (CSO) of Ministry of Statistics and Programme Implementation (MoS & PI). The Institute also runs a course for ISS Probationers on behalf of the CSO.

	Programme	Duration	Venue
ISEC Courses	Statistical Training Diploma (Regular Course)	10 months	Kolkata
	Special courses	1 to 12 months	Kolkata
CSO courses	ISS Probationer's Course in Statistical Methodology	10 weeks +	Kolkata, Delhi

+ Duration at the Indian Statistical Institute, Kolkata.

3 Stipends, Fellowships, Allowances etc.

Deserving non-sponsored students and research fellows admitted to various programmes receive stipends, fellowships and contingency/book grants as given below and are not required to pay any tuition fee.

Programme	Stipend/Fellowship per month (in Rs.)	Contingency/book grant per year (in Rs.)
B. Stat. (Hons.)/B. Math. (Hons.)	800	1500
M. Stat./M. Math/M.S. in QE	1200	2000
M. Tech. in CS/QROR	5000	5000
Junior*/Senior Research Fellowship	8000, 9000/9000 + H.R.A. as per rules	6000
SDP in SQC & OR	5600 + H.R.A. as per rules	2500
ADIS	1500	2000
Research Associateship	11000/11500/12500 + H.R.A. as per rules	6000

*** Junior Research Fellowship: i) applicants with M.E./M.Tech. or equivalent : Rs. 9000/- per month and ii) for others : Rs. 8000 per month.**
A Special Research Fellowship of Rs. 12,000 per month is also available for outstanding candidates in each of the subjects: (i) Statistics, (ii) Mathematics, (iii) Computer Science and (iv) Quantitative Economics.

Stipends are granted in the first instance for one semester/academic year only. They are renewed periodically if the progress of the student is found satisfactory. **Stipend/Fellowship granted to a student may be reduced or completely withdrawn if the academic progress, attendance in class, or character and conduct of the student are not found satisfactory.** Details of the rules pertaining to this are available in the appropriate Students' Brochure [see Section 5]. Students leaving in the middle of a course have to refund the stipend/contingency grant received, if any. At the end of each year/semester, prizes are also awarded for outstanding performance in examinations.

4 Admission Procedure

Admission to the academic programmes is strictly based on the merit of the candidates as judged from their academic records and performance in appropriate selection tests and interviews. The selection tests are held at a number of centres in India. **Section 7** gives details of eligibility conditions and selection tests for the programmes offered. If at any stage of the selection process it is found that a candidate does not satisfy the eligibility conditions, his/her application will not be processed any further. Eligibility requirements may be relaxed in some cases at the discretion of the Institute. **The decisions of the Institute in these matters are final. Canvassing in any form disqualifies a candidate from being selected.** The names of candidates called for interview on the basis of the

written tests and of those selected after interview are generally posted on the internet at the site: ***http://www.isical.ac.in/~deanweb*** in PDF format**.**

If a student fails a course and is not allowed to repeat, he/she is not eligible for readmission to the same course.

In some programmes there is a provision for employers to sponsor suitable candidates employed by them. Details of this scheme are given separately under the appropriate programmes.

Note **: Sample questions and the syllabi for the selection tests for the different courses are sent to the candidates along with admit cards after the applications are processed.**

5 Students' Brochure

Details of the courses along with the rules and regulations pertaining to the academic programmes of the Institute are given in the Students' Brochure. Usually, each student is supplied with a copy of the current brochure at the time of admission. A periodically updated version of the Students' Brochure is also available on the internet at the site: http://www.isical.ac.in/~deanweb in PDF format.

6 Discipline

The students shall observe the normal discipline of the Institute and shall not indulge in cheating in the examinations, rowdyism or any other act of indiscipline or unlawful/unethical/indecent behaviour. There are also specific attendance requirements that the students are expected to meet, details of which are mentioned in Section 7 under various Course Descriptions. Violations of these are likely to attract punishments such as withholding promotion/award of degree, withdrawing stipend and/or expulsion from the hostel/Institute.

Ragging is banned in the Institute and any one found indulging in ragging will be given punishment such as expulsion from the Institute, or, suspension from the Institute/ classes for a limited period and fine. The punishment may also take the shape of (i) withholding Stipend/Fellowship or other benefits (ii) withholding results (iii) suspension or expulsion from hostel and the likes. Local laws governing ragging are also applicable to the students of the Institute. Incidents of ragging may be reported to the police.

7 Description of Academic Programmes and Methods of Selection

For all the regular degree courses the following schedule is usually maintained. The Academic Year is divided into two semesters separated by a short break. The first semester (Semester I) for all the courses usually starts in July and ends in December. The second semester (Semester II) starts in January and, for all the courses other than the two M.Tech. courses, it usually ends in May. For the M.Tech.(CS) course, Semester II, which includes summer training, usually ends in June while for the M.Tech.(QROR) course Semester II usually ends in July after the field training.

Classes are held on weekdays (Monday to Friday) during 9:30/10.00 a.m. to 6.30 p.m. unless mentioned otherwise.
A brief account of the various courses offered by the Institute is given below. Details regarding the structure of the courses, promotion criteria, etc. can be found in the appropriate Students' Brochure at the site: http://www.isical.ac.in/~deanweb.

Note. The Institute reserves the right to make changes in course structure, syllabi, etc. as and when needed.

7.1 Bachelor of Statistics (Honours) [B.Stat.(Hons.)]

7.1.1 Scope

The B.Stat.(Hons.) degree programme offers comprehensive instruction in the theory, methods and application of Statistics, in addition to several areas of Mathematics and some basic areas of Computer Science. It also offers optional courses in some other subjects as given in 7.1.4. It is so designed that on successful completion, the students would be able to pursue higher studies in areas of Statistics and Mathematics, as well as Computer Science, Economics and allied fields, or take up careers as Statisticians in research institutions and scientific laboratories, government departments or industries. The total duration of the B.Stat.(Hons.) programme is **three years**.

7.1.2 Eligibility

In order to be eligible for admission, a student should have successfully completed 10+2 years of Higher Secondary Education (or its equivalent) with Mathematics and English as subjects of study. Any student who is asked to discontinue the B.Stat.(Hons.) programme is not eligible for readmission into this programme.

7.1.3 Selection Procedure

Each candidate applying for admission to this programme has to take a selection test comprising objective type and short-answer type questions in Mathematics at the Higher Secondary level (10+2 years' programme). Based on their performance in the tests, a number of candidates are called for Interviews. The final list of candidates selected for admission to the programme is announced after the interviews.

7.1.4 Course Structure

The three-year programme consists of a total of thirty courses distributed as five courses per semester. Three of the thirty courses are *Elective* and the rest are *compulsory* courses. In addition, students who are found to lack adequate proficiency in English at the time of admission are required to take and pass a non-credit course in Remedial English in the first semester of the first year. The list of all the credit courses during the six semesters of the programme is given below.

First Year
Semester I : *Statistical Methods I, Probability Theory I, Analysis I, Vectors & Matrices I, Computational Techniques & Programming I, Remedial English (non-credit).*
Semester II : *Statistical Methods II, Probability Theory II, Analysis II, Vectors & Matrices II, Computational Techniques & Programming II* .

Second Year
Semester I : *Statistical Methods III, Probability Theory III, Analysis III, C & Data Structures, Elective I* .
Semester II : *Statistical Methods IV, Economic Statistics & Official Statistics, Demography (half semester) and SQC & OR (half semester), Elective Course II.*

Third Year
Semester I : *Linear Statistical Models, Statistical Inference I, Sample Surveys, Differential Equation, Elective Course III* .
Semester II : *Introduction to Stochastic Processes, Statistical Inference II, Design of Experiments, Statistics Comprehensive, Database Management Systems.*

The Elective Courses are offered in four groups, each group consisting of three courses, as given below. Each student is required to select one of the four groups and take the three courses in that group.

(i) *Economics I, Economics II and Economics III* .
(ii) *Economics I, Economics II and Introduction to Sociology* .
(iii) *Biology I, Biology II and Anthropology & Human Genetics* .
(iv) *Physics I, Physics II and Geology* .

The passing score in each course (credit or non-credit) is 35%. In order to get promoted from the First Year to the Second Year, a student needs to pass all the courses in the First Year and also secure an aggregate score of at least 45% in the ten credit courses in the First Year. For promotion from the Second Year to the Third Year, the requirement is securing an aggregate score of at least 40% in the ten credit courses in the Second Year in addition to passing all the courses in the Second Year. **A student who fails to get promotion at the end of the First Year or the Second Year is asked to discontinue the programme.** On completion of the Third Year and subject to fulfilling the necessary requirements in terms of the academic performance during the three years (the details of which are available in the appropriate Students' Brochure), a student is awarded *either* the B.Stat.(Hons.) degree and placed in the First Division with Distinction or First Division or Second Division, *or* the B.Stat.(Pass) degree. Students who fail in the final year or receive a B.Stat.(Pass) degree are allowed one chance to repeat the Third Year without stipend and contingency grant, provided that in no more than eight courses during the first two years have they secured composite scores of less than 45%.

If the overall attendance of a student falls below a minimum of 75% in any semester, his/her stipend is completely withdrawn in the following semester. A student may also have full/partial stipend cut resulting from poor academic performance and/or unsatisfactory conduct. Details of the current rules in this regard are given in the appropriate Students' Brochure.

7.2 Bachelor of Mathematics (Honours) [B.Math.(Hons.)]

7.2.1 Scope

The B.Math.(Hons.) degree programme offers comprehensive instruction in basic mathematics along with rudimentary courses in Probability, Statistics, Computing and Physics. It is so designed that on successful completion, the students would be able to pursue higher studies in the areas of Mathematics, Statistics, Computer Science, Mathematical Physics etc. or take up a career in applications of Mathematics. The total duration of the B.Math.(Hons.) programme is **three years**.

7.2.2 Eligibility

In order to be eligible for admission, a student should have successfully completed 10+2 years of Higher Secondary Education (or its equivalent) with Mathematics and English as subjects of study. Any student who is asked to discontinue the B.Math.(Hons.) programme is not eligible for readmission into this programme.

7.2.3 Selection Procedure

Each candidate applying for admission to this programme has to take a selection test comprising objective type and short-answer type questions in Mathematics at the Higher Secondary level (10+2 years' programme). Based on performance in the tests, a selected list of candidates are called for Interviews. The final list of candidates selected for admission to the programme is announced after the interviews.

7.2.4 Course Structure

The three-year programme consists of a total of thirty courses distributed as five courses per semester. The list of the courses over the six semesters of the programme is given below. In addition, students who are found to lack adequate proficiency in English at the time of admission are required to take and pass a non-credit course in Remedial English in the first semester of the first year.

First Year
Semester I : *Analysis I, Algebra I, Probability Theory I, Physics I, Writing of Mathematics (non-credit).*
Semester II : *Analysis II, Algebra II, Probability Theory II, Physics II .*

Second Year
Semester I : *Analysis III, Algebra III, Statistics I, Physics III, Computer Science I..*
Semester II : *Analysis IV, Algebra IV, Statistics II, Optimization, Computer Science II.*

Third Year
Semester I : *Complex Analysis, Introduction to Differential Geometry, Introduction to Differential Equations, Statistics III, Elective Subject I .*
Semester II : *Combinatorics and Graph Theory, Introduction to Representation Theory, Physics IV, Elective Subject II, Elective Subject III.*
Elective Subjects can be chosen from the following List: Computer Science III, Computer Science IV, Statistics IV, Statistics V, Probability III, Introduction to Algebraic Geometry,

Topology, Introduction to Algebraic Number Theory, Differential Geometry II, Introduction to Differential Topology, Mathematics of Computation, Introduction to Dynamical Systems.

A review of the course structure is being planned and if there are any changes it will be notified in the website.

The passing score in each course (credit or non-credit) is 35%. In order to get promoted from the First Year to the Second Year, a student needs to pass all the courses in the First Year and also secure an aggregate score of at least 45% in the ten credit courses in the First Year. For promotion from the Second Year to the Third Year, the requirement is securing an aggregate score of at least 40% in the ten credit courses in the Second Year in addition to passing all the courses in the Second Year. **A student who fails to get promotion at the end of the First Year or the Second Year is asked to discontinue the programme.** On completion of the Third Year and subject to fulfilling the necessary requirements in terms of the academic performance during the three years (the details of which are available in the appropriate Students' Brochure), a student is awarded *either* the B.Math.(Hons.) degree and placed in the First Division with Distinction or First Division or Second Division, *or* the B.Math.(Pass) degree. Students who fail in the final year or receive a B.Math.(Pass) degree are allowed one chance to repeat the Third Year without stipend and contingency grant, provided that in no more than eight courses during the first two years they have secured composite scores of less than 45%.

If the overall attendance of a student falls below a minimum of 75% in any semester, his/her stipend is completely withdrawn in the following semester. A student may also have full/partial stipend cut resulting from poor academic performance and/or unsatisfactory conduct. Details of the current rules in this regard are given in the appropriate Students' Brochure.

7.3 Master of Statistics [M.Stat.]

7.3.1 Scope

The M.Stat. programme offers advanced level training in the theory, methods and applications of Statistics along with specialized training in selected areas of Statistics and allied fields. Depending on the area of specialization, students would be able to pursue an academic/research career in Statistics, Mathematics, Economics, Computer Science and allied fields. They would also be able to work competently as Statisticians and specialists in research institutions and scientific laboratories, government departments or industries. The total duration of the M.Stat. programme is **two years**.

7.3.2 Eligibility

In order to be eligible for admission to the M.Stat. programme, a student must have a 3-year Bachelor's degree with Statistics as full subject, or have a B.Stat./B.Math. degree from the Indian Statistical Institute or a Statistician's Diploma/Senior Diploma in Statistics from the Indian Statistical Institute . Any student who is asked to discontinue the M.Stat. programme is not eligible for readmission into this programme.

7.3.3 Selection Procedure

Students with B.Stat.(Hons.) degree from the Indian Statistical Institute are offered direct admission to the M.Stat. programme (*B*-stream) without any selection test and interview. For other eligible candidates, including students with B.Stat.(Pass) degree from the Indian Statistical Institute, selection for admission to the M.Stat. programme (*NB*-stream) is based on academic record, performance in written selection tests and subsequent interview. If a candidates holds a Statistician's Diploma/Senior Diploma in Statistics from the Indian Statistical Institute and is selected for admission, he/she may be considered for admission to the Second Year of the programme.

The selection tests consist of :

(a) A test comprising objective and/or short-answer questions in Mathematics at Bachelor's degree level.

(b) A test comprising objective and/or short-answer questions in Statistics and Mathematics at a three-year Bachelor's degree level, designed to assess competence in the theory and methods of Statistics and comprehension in Mathematics.

7.3.4 Course Structure

First Year

The First Year of the M.Stat. programme runs in three separate streams: *B*-stream for the B.Stat.(Hons.) students, Applications Streams for those who opt for two-year specialization in Applications, and, *NB*-stream for others. The curriculum for the First Year consists of ten courses each for the *B*-stream and Applications Stream, and eleven courses for the *NB*-stream, as listed below. In addition, each student has also to take a course in Official Statistics offered at the end of the First Year.

***B*-stream:**

Semester I *: Large Sample Statistical Methods, Measure Theoretic Probability, Sample Surveys & Design of Experiments, Applied Stochastic Processes, Statistical Inference I* .
Semester II : *Regression Techniques, Multivariate Analysis, Metric Topology & Complex Analysis, Elective I, Elective II* .

***Applications*-stream:**

Semester I *: Analysis I, Probability and Stochastic Processes I, Methods of Statistical Inference I, Linear Algebra, Elements of Sample Surveys and Design of Experiments*.
Semester II : *Probability and Stochastic Processes II, Linear Models and GLM, Statistical Inference II, Multivariate Analysis, Regression Techniques* .

Elective Courses: *Metric Topology and Complex Analysis, Measure Theory, Advanced Linear Algebra/Matrix Analysis, Functional Analysis, Topics in Fourier Analysis , Applied Multivariate Analysis, Advanced Sample Surveys, Topics in Design of Experiments, Survival and Actuarial Models, Nonparametric Inference, Actuarial Methods, Generalized inverses and applications, Microeconomics I, Macroeconomics I, Microeconomics II, Game Theory, Finance, Special Topics.*

***NB*-stream:**

Semester I : *Linear Algebra & Linear Models, Real Analysis, Large sample Theory & Markov Chain, Sample Surveys & Design of Experiments, Statistical Inference I* .
Semester II : *Regression Techniques, Multivariate Analysis, Measure Theoretic Probability, Programming & Data Structures, Elective I, Elective II* .

A student is promoted from the First Year to the Second Year of the M.Stat. programme provided, in the First Year, his/her attendance and conduct is satisfactory and his/her composite score in no course is less than 35% and the average composite score in all the courses taken together is not less than 45%. **Students who fail to get promoted are asked to discontinue the programme.**

Second Year

Each student in Applications stream promoted to the Second Year continues to specialize in Applications; there is a scope to change the specialization in the second year on the advice of the Teachers' Committee.
Semester III *: Analysis II, Statistical Computing, Time Series Analysis, Elective I , Elective II* .
Semester IV : *Probability and Stochastic Processes III, Project, Elective III, Elective IV, Elective V* .
Others students promoted to the second year and those admitted directly are required to choose an area of specialization for the Second Year of the M.Stat. programme. Each specialization has a number of prerequisites in terms of specific courses. Depending on availability of students opting for a specialization and availability of adequate resources, specializations from the following list are offered. The compulsory courses for each specialization are also listed against the specialization.

(a) Advanced Probability (AP) : *Advanced Probability I, Functional Analysis, Stochastic Processes I , Stochastic Processes II.*
(b) Actuarial Statistics (AS) : *Actuarial Methods, Life Contingencies, Actuarial Models, Survival Analysis.*
(c) Applied Statistics & Data Analysis (ASDA) : Advanced Design of Experiments, Analysis of Discrete Data, Statistical Computing, Advanced Sample Surveys, Applied Multivariate Analysis.
(d) Bio-Statistics & Data Analysis (BSDA) : Statistical Methods in Genetics I, Analysis of Discrete Data, Statistical Computing, Survival Analysis, Statistical Methods in Public Health, Statistical Methods in Biomedical Research.
(e) Industrial Statistics & Operations Research (ISOR) : *Advanced Design of Experiments, Life Testing and Reliability, Quality Control and Its Management, Management Applications of Optimization, Industrial Applications of Stochastic Processes, Optimization Techniques II.*
(f) Mathematical Statistics & Probability (MSP) : *Advanced Probability I, Functional Analysis, Stochastic Processes I, Statistical Inference II.*
(g) Quantitative Economics (QE) : *Microeconomics I, Game Theory I, Econometric Methods, Macroeconomics I.*
Not all specializations may be offered at all the centres. In case a particular specialization is not offered at a centre, a student of that centre opting for that specialization may be asked to study at a different centre where such specialization is

offered. The final selection of students for various specializations will depend on students' preferences, their academic background as well as their performance in the First Year. Each student in the Second Year has to take a total of ten courses (five in each semester), which will include all the Compulsory Courses for his/her specialization and a certain number (as required by the specialization) of courses from the Main List of Elective Courses for his/her specialization. The remaining elective courses, if any, can be selected from any other course offered in M.Stat. Second Year. A detailed list of all the courses for the various specializations is available in the appropriate Students' Brochure.

On completion of the Second Year and subject to fulfilling the necessary requirements in terms of the academic performance during the two years (the details of which are available in the appropriate Students' Brochure), a student is awarded M.Stat. degree and placed *either* in the First Division with Distinction *or* in the First Division *or* in the Second Division. Students who fail in the final year are allowed one chance to repeat the Second Year without stipend and contingency grant, provided that his/her average composite score in the Second Year is not less than 35% and that his/her conduct is satisfactory.

If the overall attendance of a student falls below a minimum of 75% in any semester, his/her stipend is completely withdrawn in the following semester. A student may also have full/partial stipend cut resulting from poor academic performance and/or unsatisfactory conduct. Details of the current rules in this regard are given in the appropriate Students' Brochure.

7.4 Master of Mathematics [M.Math.]

7.4.1 Scope

The M. Math. programme offers advanced level training in Mathematics. On successful completion of the course, students would be able to pursue a research/academic career in Mathematics. Depending on the choice of the optional subjects, the students would also be able to work in the fields of Probability Theory and Theoretical Computer Science. The total duration of the M.Math. programme is **two years**.

7.4.2 Eligibility

In order to be eligible for admission to the M.Math. programme, a student must *either* have a three-year Bachelor's degree or a B. E./B. Tech. Degree, with Mathematics and **an exceptionally strong background in Analysis and Abstract Algebra** *or* have a B. Stat. /B. Math. degree of the Indian Statistical Institute. Any student who is asked to discontinue the M.Math. programme is not eligible for readmission into this programme.

7.4.3 Selection Procedure

Students with B.Math.(Hons.) degree from the Indian Statistical Institute are offered direct admission to the M.Math. programme without any selection test and interview. For other eligible candidates, including students with B.Math.(Pass) degree from the Indian

Statistical Institute, selection for admission to the M.Math. programme is based on academic record, performance in written selection tests and subsequent interview.
The selection tests will comprise of objective and/or short-answer type questions in Mathematics at a level corresponding roughly to the Mathematics Honours/Mathematics Major of Indian universities, with special emphasis on Real Analysis, Linear and Abstract Algebra.

7.4.4 Course Structure

The programme will be conducted in four semesters. A student will have to take five courses each semester.

Compulsory Courses: *General Topology, Complex Analysis, Measure theory, Algebra I, Algebra II, Functional Analysis, Algebraic Topology, Differential Geometry, Fourier Analysis, Partial Differential Equations I, Graph Theory and Combinatorics, Advanced Probability, Representations of Groups.*

Elective Courses: *Algebra III (Commutative Algebra), Number Theory, Algebraic Geometry, Algebraic Number Theory, Probability & Stochastic process I (Markov Chains and Markov Processes), Probability & Stochastic process II, Ergodic Theory, Lie Groups & Lie Algebras, Partial Differential Equations II, Algebraic Groups, Algebraic and Differential Topology, Advanced Functional Analysis, Operator Theory, Set Theory, Mathematical Logic, Theory of Computation, Advanced Fluid Dynamics, Quantum Mechanics I, Quantum Mechanics II, Analytical Mechanics, Advanced Linear Algebra, Special Topics* (to be suggested by the faculty).
Offering an elective course will depend on students' interest and availability of teachers. The details of sequencing of the courses over the four semesters and the specific prerequisites for different courses are available in the appropriate Students' Brochure.

A student is promoted from the First Year to the Second Year of the M.Math. Programme provided, in the First Year, his/her attendance and conduct are satisfactory and his/her composite score in no course is less than 35% and the average composite score in all the courses taken together is not less than 45%. **Students who fail to get promoted are asked to discontinue the programme.** On completion of the Second Year and subject to fulfilling the necessary requirements in terms of the academic performance during the two years (the details of which are available in the appropriate Students' Brochure), a student is awarded M.Math. degree and placed *either* in the First Division with Distinction *or* in the First Division *or* in the Second Division. Students who fail in the final year are allowed one chance to repeat the Second Year without stipend and contingency grant, provided that his/her average composite score in the Second Year is not less than 35% and that his/her conduct is satisfactory.

If the overall attendance of a student falls below a minimum of 75% in any semester, his/her stipend is completely withdrawn in the following semester. A student may also have full/partial stipend cut resulting from poor academic performance and/or unsatisfactory conduct. Details of the current rules in this regard are given in the appropriate Students' Brochure.

7.5 Master of Science in Quantitative Economics [M.S.(Q.E.)]

7.5.1 Scope

This is an advanced course in Economics and its applications with special emphasis on quantitative methods. On completion of the course, the students would be able to pursue an academic career in Economics or take up responsible positions in various private and public sector organizations. The total duration of the M.S.(Q.E.) programme is **two years.**

7.5.2 Eligibility

In order to be eligible for admission to the M.S.(Q.E.), a student must have a three-year Bachelor's degree in Economics/Mathematics/Statistics/Physics or a B.Stat. degree from the Indian Statistical Institute. Engineering graduates are also eligible to apply. Candidates should have knowledge of Economics and Mathematics at B.A./B.Sc. pass level. Any student who is asked to discontinue the M.S.(QE) programme is not eligible for readmission into this programme.

7.5.3 Selection Procedure

Selection of candidates to the M.S.(Q.E.) programme will be based on academic record and performance in written tests and interview. The selection tests will comprise of objective and/or short-answer questions in **both Economics and Mathematics at the Bachelor's degree level.**

7.5.4 Course Structure

There will be 8 compulsory courses and 12 elective courses. The compulsory courses, along with their sequencing over the semesters are as follows :

First Year
Semester I : *Microeconomic Theory I, Game Theory I, Statistics, Mathematical Methods* and One Elective Course.
Semester II : *Microeconomic Theory II, Macroeconomic Theory I, Econometric Methods I* and Two Elective Courses.

Second Year
Semester I : *Macroeconomic Theory II* and any Four from the list of Elective Courses.
Semester II : Any Five from the list of Elective Courses.

List of Elective Courses

Computer Programming and Applications, Econometric Methods II, Econometric Applications I, Econometric Applications II, Time Series Analysis and Forecasting, Sample Surveys : Theory and Practice, Bayesian Econometrics, Mathematical Programming with Applications to Economics, Game Theory II, Economic Development I, Economic Development II, Intertemporal Economics, Modern Growth Theory, Industrial Organization, Theory of Planning, Social Accounting, Agricultural Economics, Public Economics, Regional Economics, International Economics I,

International Economics II, Advanced Topics in International Economics, Monetary Economics, History of Economic Thought, Social Choice and Political Economy, Incentives and Organizations, Privatization and Regulations, Environmental Economics, Theory of Finance I, Theory of Finance II, Theory of Finance III, Political Economy and Comparative Systems, Selected Topics I, Selected Topics II .

Offering an elective course will depend on students' interest and availability of teachers. A student is promoted from the First Year to the Second Year of the M.S.(Q.E.) Programme provided, in the First Year, his/her attendance and conduct is satisfactory and his/her composite score in no course is less than 35% and the average composite score in all the courses taken together is not less than 45%. **Students who fail to get promoted are asked to discontinue the programme**. On completion of the Second Year and subject to fulfilling the necessary requirements in terms of the academic performance during the two years (the details of which are available in the appropriate Students' Brochure), a student is awarded M.S.(Q.E.) degree and placed *either* in the First Division with Distinction *or* in the First Division *or* in the Second Division. Students who fail in the final year are allowed one chance to repeat the Second Year without stipend and contingency grant, provided that his/her average composite score in the Second Year is not less than 35% and that his/her conduct is satisfactory.

If the overall attendance of a student falls below a minimum of 75% in any semester, his/her stipend is completely withdrawn in the following semester. A student may also have full/partial stipend cut resulting from poor academic performance and/or unsatisfactory conduct. Details of the current rules in this regard are given in the appropriate Students' Brochure.

7.6 Master of Technology in Computer Science [M. Tech. (CS)]

7.6.1 Scope

The Master of Technology in Computer Science course is offered in Kolkata. The course is designed to provide a balanced mixture of theoretical and professional training in Computer Science and Technology so that the students, on successful completion of the course, may take up either (a) a professional career in the technology of software for computer systems or specialized application areas, or (b) an academic career for further study and research in the fundamental and applied aspects of Computer Science and Technology and related disciplines.

7.6.2 Eligibility

A candidate seeking admission to this course should possess one of the following minimum academic qualifications : (i) a Master's degree in Mathematics/ Statistics/ Physics/ Electronic Sciences/ Computer Science/ Computer Applications/Information Technology or (ii) a Bachelor's degree in Engineering/Technology or any other qualification considered equivalent (such as AMIE or, GRAD-IETE or, DOEACC 'B' Level). Any student who is asked to discontinue the M.Tech.(CS) programme is not eligible for readmission into this programme.

7.6.3 Selection Procedure

All candidates are admitted through an all-India selection test and an interview. A few candidates may be sponsored by government, semi-government, public sector undertakings and autonomous institutions but such candidates also will be admitted through the selection test; the Institute at its discretion may apply a different criterion for such candidates. A candidate would be considered sponsored only if he/she is given leave and full salary by the employer for the full duration of the course. Sponsored candidates will not receive any stipend and their sponsors will have to pay a tuition fee of Rs. 20,000/- per year.

Selection test will consist of two parts :
(a) An objective and/or short-answer type test in Mathematics at the B.Sc. (Pass) level
(b) An objective and/or short-answer type test comprising :

Group A : A test for all candidates in Mathematics at B.Sc.(Pass) level and logical reasoning.

Group B : A test, divided into five sections carrying equal marks, in Mathematics, Statistics and Physics at the M.Sc. level and in Computer Science, Engineering and Technology at B.Tech. level. A student has to answer questions in one of these sections only.

7.6.4 Course Structure

The duration of the Master of Technology in Computer Science course is two years which is divided into four semesters. A student is required to take six courses in each semester, making up a total of twenty-four courses, of which two are accounted for by the dissertation work to be done during the third and fourth semesters. In addition, a student has to undergo, after successful completion of course work in the first and second semesters, a compulsory practical training of about eight weeks in a research institute or a public/private sector organization under the guidance of an assigned supervisor in that institute/organization.

Further, a student may undergo extra non-credit courses, at most one per semester, either recommended by the faculty or in his/her own interest.

The courses of study in various semesters are as follows.

First Year

Semester I
Programming Languages and Methodology, Discrete Mathematics, Data and File Structures and three from the List *A* courses as advised by the faculty depending on the background of the student.

List A : *Switching Circuits and Logic Design, Computer Organization, Assembly Language and Systems Programming, Optimization Techniques, Elements of, Algebraic Structures, Probability and Stochastic Processes, Numerical Analysis.*

Semester II

Computer Networks, Design and Analysis of Algorithms, Automata Languages and Computation, Computer Architecture, Operating Systems, Software Engineering.

Second Year

Semester III

Data Base Management Systems, Internet and Multimedia Technologies, Compiler Construction and two from the List *B* of courses as advised by the faculty depending on the background of the student and *Dissertation* (to be continued through the fourth semester).

List B : *Pattern Recognition and Image Processing, Digital Signal Processing, Cryptology, Advanced Algorithms for Graph and Combinatorial Optimization Problems, Artificial Intelligence, VLSI Design and Algorithm, Computer Graphics, Parallel Processing : Architectures and Algorithms, Advanced Operating Systems.*

Semester IV

Five electives to be selected from List *C* given below and *Dissertation* (continued from the third semester).

List *C* : *Formal Aspects of Programming Languages and Methodology, Computational Complexity, Topics in Algorithms and Complexity, Logic for Computer Science, Formal Methods in Computer Science - Selected Topics, Logic Programming and Deductive Databases, Topics in Algebraic Computation, Lambda Calculus Combinators and Functional Programming, Information and Coding Theory, Advanced Cryptology, Multi-dimensional Search and Computational Geometry, Real-Time Systems, Fault-tolerant Computing, Data Mining and Knowledge Discovery, Advanced Database Theory and Applications, Advanced Pattern Recognition, Advanced Image Processing, Computer Vision, Robotics, Analysis of Remote Sensing Images, Fuzzy Logic and Applications, Neural Networks and Applications, Advanced Web Technologies/Advanced Internet Programming, Document Processing and Retrieval, Selected Topics on the Recent Development in Computer Science* (as suggested by the faculty).

The teachers' committee determines the subjects to be offered in any particular semester.

Dissertation: A student is required to work for a dissertation on a topic assigned/approved by the teachers' committee under the supervision of a suitable ISI faculty member. The work for a dissertation should be substantial and relate to some important problem in an area of computer science and/or its applications and should have substantial theoretical or practical significance. A critical review of recent advances in an area of computer science and/or its applications with some contribution by the student is also acceptable as a dissertation.

The work should be commenced at the beginning of the third semester and be completed along with the courses of the fourth semester. The dissertation should be submitted by the middle of July of the year of completion. The dissertation will be evaluated by a committee consisting of the faculties, the supervisor and external expert(s). The student has to defend his/her dissertation in an open seminar. The dissertation is considered to be equivalent to two credit courses.

The final result of a student is decided on the basis of his/her performance in all the courses, projects, practical training and dissertation.

The Final result of a student is decided on the basis of his/her performance in all the courses, summer training and dissertation. A student admitted to the first year of the programme is allowed to attend the second semester of the programme if he/she passes the first semestral examinations, otherwise he/she has to discontinue the programme. A student who takes all the second semestral examinations will be allowed to go for factory training, otherwise, he/she has to discontinue the programme. A student who passes the second semestral examination and completes the factory training satisfactorily (certified by the guide) is promoted to the third semester of the programme, otherwise, he/she has to discontinue the programme. A student promoted to the third semester of the programme will be allowed to attend the fourth semester of the programme if he/she passes the third semestral examinations. A student who submits his/her dissertation and project report within the prescribed time limit and passes the fourth semestral examinations will be declared to have completed the fourth semester of the programme. If a student fails in a course work in any semester, he/she will be allowed to appear at backpaper examination. At most one backpaper examination is allowed in a given subject. A student can take a maximum of 2(two) backpaper examinations in the first year and a maximum of 2(two) in the second year. However, there will be no backpaper examination for the Dissertation.

A student passing the M.Tech.(CS) is placed in the First Division with Honours, First Division or Second Division depending on his/her performance.

7.7 Master of Technology in Quality, Reliability and Operations Research [M. Tech. (QROR)]

7.7.1 Scope

The Master of Technology programme in Quality, Reliability and Operations Research is a full time programme and is offered at Kolkata. This programme is intended to develop specialists in Quality Management with emphasis on Statistical Quality Control, Reliability, Operations Research, Computer Software and Management Systems. The objective is to equip students with the necessary skills together with sufficient theory to understand the principles involved in applications and to develop in them the power of systematic thinking and reasoning and methodical approach to solving live industry problems of quality, reliability and productivity. Besides undergoing classroom instruction, every student shall do dissertation and project work on live problems of industry directly under the guidance of the faculty of ISI.

The Statistical techniques and operations research methods covered as part of the curriculum will greatly facilitate introduction of techniques of quality management and technology in the industries. Moreover these quantitative techniques/methodologies will also be useful for the successful implementation of ISO 9000, QS 9000, ISO 14000, Six Sigma and other similar programmes adopted by the industries. On successful completion of this programme, the students may take up either (a) a professional career in the field of quality, engineering and management, or (b) an academic career for further study and research in theoretical and applied aspects of Quality, Reliability and Operations Research.

7.7.2 Eligibility

A candidate seeking admission to this course should

(i) ordinarily have completed 21 years of age (relaxable in special cases);

(ii) be conversant with the following topics: Mathematics (at graduate level) and knowledge of Physics and Chemistry (at the higher secondary level);

(iii) possess any one of the following minimum qualifications:

a. Master's degree in Statistics.
b. Master's degree in Mathematics with Probability and Statistics as major subjects.
c. Bachelor's Degree in Engineering or Technology or any other qualification considered equivalent.
d. Post-Graduate Diploma in SQC & OR from the Indian Statistical Institute.

Any student who is asked to discontinue the M.Tech.(QROR) programme is not eligible for readmission into this programme.

The programme is offered in two streams :

Statistics Stream for candidates with qualifications as in a, b, or d of (iii) above;
Engineering Stream for candidates with Bachelor's/equivalent degree in engineering or technology as in (iii) c above.

7.7.3 Selection Procedure

All candidates, including sponsored ones, are admitted through a selection test. For admission to this course, valid GATE score is not necessary and the candidates with valid GATE score are also admitted through the selection test. There is however a provision for sponsorship by government, semi-government, public sector undertakings, autonomous institutions and industrial organisations. Organisations can sponsor candidates from their establishments for this programme provided they satisfy the eligibility requirements. The Institute, at its discretion, may apply a different criterion for such candidates. A candidate would be considered sponsored only if the employer, for the entire duration of the programme, gives him/her leave and full salary. Sponsored candidates will not receive any stipend and their sponsors will have to pay a tuition fee of Rs. 20,000/- per year.

Selection test will consist of two parts :

(a) An objective and/or short-answer type test in mathematics at the B.Sc. (Pass) level.

(b) An objective and/or short-answer type test for the two streams as follows:
Part I (for Statistics Stream) : A test divided into two sections carrying equal marks, in Statistics and Probability. A student has to answer questions from both the sections.
Part II (for Engineering Stream) : A test divided into several sections carrying equal marks in Mathematics, Engineering Mechanics, Electrical Sciences, Thermodynamics, Mechanical Properties of Metals, Engineering Drawing etc. A student has to answer Mathematics section compulsorily and any three of remaining sections.

7.7.4 Course Structure

The Master of Technology in Quality, Reliability and Operations Research is conducted in four semesters, two semesters each in the first and second years. The following courses are offered in the first year.

(a) *For the Statistics stream* : (i) Electrical and Electronics Engineering, (ii) SQC - I & II, (iii) Operations Research - I, (iv) Programming Techniques and Data Structures, (v) Quality Management and Systems, (vi) Workshop I & II, (vii) Mechanical Engineering, (viii) Instrumentation and Computer Engineering, (ix) Industrial Engineering and Management, (x) Reliability - I.

(b) *For the Engineering stream* : (i) Probability - I & II, (ii) Statistical Methods - I & II, (iii) SQC - I & II, (iv) Operations Research - I, (v) Programming Techniques and Data Structures, (vi) Quality Management and Systems, (vii) Instrumentation and Computer Engineering, (viii) Industrial Engineering and Management, (ix) Reliability - I.

The following courses are offered during the second year for both the streams: (i) Operations Research - II, (ii) Industrial Experimentation, (iii) Reliability - II, and three elective subjects to be selected from a broad range of subjects like Applied Stochastic Processes, Advanced Statistical Methods, Advanced Optimization Techniques, Software Engineering, Database Management Systems, Advanced Reliability, Game Theory and Decision Theory, or other selected subjects as suggested by the Faculty.

However, from the above list of elective subjects, the teachers' committee will decide on subjects to be offered to the students and also the combination a student may take up.

In addition, at the end of the first year, students have to undertake a project at a factory. During the fourth semester of the second year, they have to work on dissertation at the Institute and also have to undertake the second project at a factory.

A student will be allowed to take a semestral examination in any course if he/she attends at least 75% of all classes in the semester and his/her character and conduct are satisfactory.

The Final result of a student is decided on the basis of his/her performance in all the courses, projects and dissertation. A student admitted to the first year of the programme is allowed to attend the second semester of the programme if he/she passes the first semestral examinations, otherwise he/she has to discontinue the programme. A student who takes all the second semestral examinations will be allowed to go for factory training, otherwise, he/she has to discontinue the programme. A student who passes the second semestral examination and completes the factory training satisfactorily (certified by the guide) is promoted to the third semester of the programme, otherwise, he/she has to discontinue the programme. A student promoted to the third semester of the programme will be allowed to attend the fourth semester of the programme if he/she passes the third semestral examinations. A student who submits his/her dissertation and project report within the prescribed time limit and passes the fourth semestral examinations will be declared to have completed the fourth semester of the programme. If a student fails in the course work, he/she will be allowed to appear at backpaper examinations. At most one backpaper examination is allowed in a given course. A student can take a maximum of 2(two) backpaper examinations in any of the four semesters of the programme subject to a ceiling of a maximum of 2(two) in the first year

and 2(two) in the second year. However, there will be no backpaper examinations for Dissertation, Project-I and Project-II.

A student passing the M.Tech.(QROR) degree examination is placed in the First Division with Distinction, First Division or Second Division depending on his/her performance.

7.8 Associateship in Documentation and Information Science (ADIS)

7.8.1 Scope

The course is offered in Bangalore. It gives comprehensive instruction in the theory and practice of documentation and information science. The project work, colloquia and seminars are designed to develop in the student the capacity for systematic thinking and exposition. The duration of the course is two years.

7.8.2 Eligibility

The minimum qualification for admission to the course is

(i) Bachelor's degree in Library Science, or

(ii) Master's degree in any subject and at least two years' library/ documentation/ information handling experience, or

(iii) a four-year plus degree, such as B.E. and M.B.B.S. and at least two years' library/documentation/information handling experience.

The candidates must have secured at least 55% marks in undergraduate and postgraduate degree programmes, as applicable.

7.8.3 Course Structure

The curriculum consists of a formal residential course for one year followed by a research project. No tuition fees are charged. A stipend of Rs. 1500/- per month and an annual contingency grant of Rs. 2000/- may be granted to deserving students.

The course covers the following subjects :
Foundation of Information Science, Information Sources and Communication Media, Information Systems and Programmes, Information Processing and Organization, Information Transfer and Dissemination, Information Technology and Systems Design, Information Centre/System Planning and Management and one elective subject from :
Industrial Information Service, Information Systems for R & D, Information Systems for Planning, Management Information Systems, Health Science Information Systems and Services, Environmental Information Systems and Services, Social Sciences Information Systems and Services.

In addition, a student has to participate in project work and write a dissertation on an assigned topic and attend supporting courses on relevant selections from :
Research Methodology, Statistical Methods, Operations Research and Systems Analysis, Linguistics, Communication and Technical Writing.

7.9 Part-time Course in Statistical Quality Control

7.9.1 Scope

This course is intended to provide intensive training in the theory and practice of SQC. Emphasis is on equipping the students with the basic practical skills in SQC approach with sufficient theory to understand the principles involved and to develop in them the power of systematic thinking, practical approach and exposition. The course is offered in Bangalore and Hyderabad. But it is not offered at a centre in a session unless at least 10 selected candidates are enrolled for it.

7.9.2 Duration

The course is held twice a year and extends over a period of 6 months : January-June and July-December. Classes are usually held on five days a week in two sessions of one hour each commencing at 1800 hours.

7.9.3 Eligibility

Admission is restricted to persons working in industrial, commercial or scientific organizations and sponsored by their organizations. Minimum educational qualifications are any one of the following :

(i) Diploma in any branch of Engineering or Technology from a recognized Institution.

(ii) Bachelor's degree (with Mathematics at the pre-university or equivalent level) from a recognized university or institution.

Candidates should normally be under 35 years of age. Candidates should possess a minimum of one year's working experience in an industrial, commercial or scientific organization. The sponsoring organizations must ensure

(i) that their candidates will attend at least 75% of the classes,

(ii) adequate opportunities for the candidates to carry out the project work on some problem of interest to them,

(iii) facilities - such as transport - to the SQC and OR Unit for supervising the project work.

7.9.4 Course Structure

The course comprises lectures, practical exercises, assigned reading, home tasks, tutorials, seminars, group discussions and project studies on Statistical Methods and SQC Techniques. Project work runs concurrently outside the class hours in the candidate's own organization.

A fee of Rs. 1500/- is charged.

The course is under review.

7.10 Intensive Course in Programming and Application of Electronic Computers

(This course will be notified separately.)

7.10.1 Scope

The objective of this course is to impart a thorough knowledge of systems and programming work in connection with the use of electronic digital computers. It is a full-time course comprising lectures, demonstrations, directed reading and practical assignments. The training is of a general nature and not restricted to the particular system of machines available in the Institute. The course is offered in Kolkata, subject to availability of facilities.

7.10.2 Duration and Class Hours

The duration of the course is 10 weeks. Classes are ordinarily held during the day between 1000 and 1700 hours. Depending on availability of the computer system, practical classes may be held at any time between 0700 and 2200 hours. The course is usually conducted during October-December.

7.10.3 Eligibility

Persons with good academic record, preferably with knowledge of mathematics up to the graduate level, and currently engaged in research and/or related activities are eligible for admission to the course.

7.10.4 Course Structure

The course covers Fundamentals of Digital Electronic Computers, Conventional Computing Equipment and Programming in a High Level Language. The course structure is under review.
A course fee of Rs. 1500/- is charged.

7.11 Junior/Senior Research Fellowships (JRF/SRF)

7.11.1 Research Fellowships in Statistics, Mathematics, Quantitative Economics and Computer Science

7.11.1.1 Scope

The Institute offers Junior Research Fellowships to candidates in Statistics, Mathematics, Quantitative Economics and Computer Science. A candidate admitted as a Research Fellow is expected to take research courses and also engage in original research-work in one of the above areas under the guidance of a supervisor appointed by the Institute, culminating in a doctoral thesis to be submitted for a Ph.D. degree. Candidates making satisfactory progress towards the above goal are eligible to register for the Ph.D. degree of the Indian Statistical Institute. At the end of the second year, the Junior Research Fellows are assessed for the award of Senior Research Fellowships. The total duration of Junior and Senior Research Fellowships **shall not exceed 5 years**.

A Special Fellowship of Rs. 12,000 per month is also available for exceptionally meritorious candidates in each of the subjects: (i) Statistics, (ii) Mathematics, (iii) Computer Science and (iv) Quantitative Economics.

7.11.1.2 Eligibility for admission to the JRF programme

Statistics **:** (i) A good academic record with M.Stat., M.A./M.Sc. or equivalent degree in Statistics or, (ii) outstanding mathematical maturity with B.Stat./B.Math., B.A./B.Sc. or equivalent degree with Statistics as the main subject.

Mathematics **:** (i) A good academic record with M.Stat., M.Math., M.A./M.Sc. or equivalent degree in Mathematics or, (ii) outstanding mathematical maturity with B.Stat./B.Math., B.A./B.Sc. or equivalent degree with Mathematics as the main subject.

Quantitative Economics **:** (i) A good academic record with M.S.(QE), M.Stat., M.A./M.Sc. or equivalent degree in Statistics/ Mathematics/ Economics/ Econometrics or, (ii) outstanding mathematical maturity with B.A./B.Sc. degree with Economics as the main subject. A candidate possessing a Master's degree in any subject with Mathematics/Statistics at B.A./B.Sc. (Pass) level will also be eligible.

Computer Science **:** A good academic record with M.E./ M.Tech. or equivalent degree in Electronics/ Telecommunication/ Radio Physics/ Computer Science/ Electrical Engineering/ Microwave Communications/ Information Technology or a good academic record with M.Sc./ M.C.A./ M.A. or equivalent degree in Physics/ Mathematics / Statistics / Electronic Sciences / Computer Science / Atmospheric Science / Information Technology with Mathematics as a compulsory subject at the graduate level. Outstanding candidates having B.E./ B.Tech./ equivalent degree in the above subjects will also be eligible.

7.11.1.3 Selection Procedure

Subject to satisfying the eligibility criteria, the selection of candidates for JRF is strictly based on merit as judged by academic record, performance in selection tests and interviews.
Note : The candidates who have been awarded research fellowship by CSIR/NBHM can seek an interview any time of the year and, on the basis of performance in the interview, are admitted as CSIR/NBHM fellows working at ISI.

Current Research Interests in Statistics, Mathematics, Quantitative Economics and Computer Science :

Kolkata

Statistics **:** Asymptotic Theory in Statistics, Large Deviations, Decision Theory, Statistical Inference : parametric, non-parametric and semi-parametric, Bayesian Analysis, Resampling Plans, Sequential Analysis, Multivariate Analysis, Parametric/Non-parametric Regression Analysis, Robustness, Discrete and Categorical Data Analysis, Linear Models, Parametric/Non-parametric Discriminant Analysis, Biostatistics, Environmental Data Analysis, Reliability, Directional Data Analysis, Growth Curve Modelling, Exploratory Data Analysis, Ranking and Selection,

Constructional and Combinatorial Aspects of Designs, Optimal Designs, Sampling Theory and Surveys.

Stochastic Processes, Inference in High Dimensional Models.

Applications of Statistics in Geology, Molecular Biology, Human Genetics, Social Sciences and Industrial (Quality) Engineering; GIS Applications, Statistical Computation, Cryptology, Image Analysis, Brain Modelling, Bio-statistics, HIV/AIDS Modelling.

Mathematics **:** Functional Analysis, Geometry of Banach Spaces, General and Algebraic Topology, Differential Topology, Symplectic topology,Transformation Groups, Harmonic Analysis, Ergodic Theory, Commutative Algebra, Combinatorics, Graph Theory and Applications to Social Sciences, Descriptive Set Theory, Spectral Theory of Differential Operators, Non-commutative Geometry, Stochastic Calculus, Markov Chains, Diffusion, Random Matrices, Limit Theorems, Stochastic Approximations and Cryptology.

Quantitative Economics **:** Microeconomics, Macroeconomics, International Trade, Development Economics, Welfare Economics, Game Theory, Voting Theory, Contract Theory, Industrial Organization, Financial Economics, Social Choice and Political Economy, Public Economics, Economic Growth, Indian Economic Problems, Agricultural Economics, Environmental Economics, Time Series Econometrics, Financial Econometrics, Empirical/Applied Econometrics.

Computer Science **:** Computer Networks, Sensor Networks, Parallel/Distributed Architectures and Algorithms, Mobile Computing, Parallel and Distributed Computing, VLSI Design and Testing, Computational Geometry, Computational Biology, Fault Tolerance, Graph Theory, Algorithms and Computational Complexity, Programming Languages and Methodology, Nanotechnology and Giga-scale Integration, IP-protection, Powerware Architecture.

Pattern Recognition, Machine Learning, Image and Video Processing, Computer Vision, Artificial Intelligence, Natural Language Processing, Data Mining, Web Intelligence, Text Mining, Information Retrieval, Speech and Signal Processing, Biomedical Image Processing, Soft Computing, Fuzzy Sets and Systems, Computational Linguistics, Uncertainty Analysis, Fuzzy Control, Artificial Neural Nets, Rough Sets, Neuro-fuzzy and Hybrid Systems, Atmospheric Science, Remote Sensing, Digital Document Analysis, Mathematical Morphology, Fractals, Wavelets, Evolutionary Computing, Chaos, Artificial Immune System, Neurodynamics, Case Based Reasoning, Digital Watermarking, Cryptology, Bioinformatics, Granular Computing. Theory and Applications of Two-dimensional Cellular Automata.

Design and Analysis of Algorithms, Algorithmic Graph Theory and Combinatorial Optimization, Automata and Formal Languages, Computational Complexity, Cryptology, Coding Theory, Information Theory, Quantum Computing, Logic and Computer Science.

Delhi

Statistics and Mathematics **:** Asymptotic Statistical Theory, Stochastic Processes (theory and applications), Inference in Stochastic Processes, Stochastic Differential Equations, Stochastic Control Theory, Martingale Problems and Markov Processes, White Noise Theory, Non-linear Filtering, Percolation Theory, Particle Systems and Random Graphs, Superprocesses, Quantum Probability and Irreversible Processes, Statistical Theory of Reliability and Inference, Stochastic Orderings, Nonparametric Inference, Survival Analysis, Design and Analysis of Experiments, Quantum Groups and Noncommutative Geometry, Perturbation of Linear Operators, Matrices and Graphs, Generalized Inverses, Mathematical Finance and Cryptography.

Quantitative Economics **:** Game Theory and Applications, Behavioral Economics, Voting Theory, Social Choice Theory, Agricultural & Natural Resource Economics, Growth Theory, Political Economy, Economics of Structural Change, Econometrics of Panel Data, Estimation of Discrete Choice Models and Dynamic Programming Models, Theory of Incentives and Public Goods, Finance, Environmental Economics, Economics of the Public Sector, Industrial organization, International Trade Policies, Development Economics, Dynamics of Wealth and Income Distribution.

Bangalore

Statistics and Mathematics **:** Optimal Designs: Construction and Combinatorial Aspects, Probability Theory on Infinite Dimensional Vector Spaces, Diffusion Processes, Stochastic Calculus, Limit theorems for fractional Brownian and Stable motions, Sample Surveys, Large Sample Theory, Bayesian Inference, Finite series analysis (ARIMA models), Functional Analysis, Geometry of Banach Spaces, Operator Algebras, Operator Theory, Harmonic Analysis on semi-simple Lie Groups and the Heisenberg group. Combinatorics, Simple Group Theory, their representations and the associated geometries and the non associative algebras, Differential Geometry, Partial Differential Operators, Probability measures on groups, Algebraic groups, Low-dimensional topology, Geometric group theory, Algebraic geometry and Algebraic Number Theory.

Quantitative Economics : Agricultural Economics, Computable General Equilibrium Models, Bayesian Analysis, Macroeconomic Models, Poverty Analysis, Econometric Applications.

7.11.2 Research Fellowships in other fields

7.11.2.1 Scope

The Institute also offers Junior/Senior Research Fellowships in several areas of Natural Sciences and Social Sciences. However, candidates working for Ph.D. in any area other than the four mentioned in 7.11.1 need to register with other Universities/Institutes for their Ph.D. A student is initially admitted as a Junior Research Fellow. After two years of satisfactory progress, the Junior Research Fellows are assessed for the award of Senior Research Fellowships. The combined duration of the Junior and Senior Research Fellowships is **five** years. The areas in which the Institute wants to recruit JRFs in 2007

in Kolkata and the respective eligibility conditions for applying for admission are as follows.

(a) **Geology** : Structural Geology ; tectonics ; basin analysis.

Eligibility : A good academic record with M. Sc. in Geology / Applied Geology or equivalent.

(b) **Physics and Applied Mathematics** : Quantum Mechanics, Condensed matter, High Energy Physics, Quantum Field Theory, Fluid Mechanics.

Eligibility : A good academic record with M.Sc. in Physics / Mathematics / Statistics.

(c) **Agriculture and Ecology** : Plant Biotechnology.

Eligibility : A good academic record with M.Sc. in Biotechnology / Botany / Zoology / Physiology / Biochemistry / Genetics / Molecular Biology / Genetic Engineering.

(d) **Sociology** : Comparative development and social transformation : agrarian relations/ rural development/ decentralization of planning/ evaluation of primary education and literacy & post literacy programme / gender studies/ religious and ethnic studies/ social network.

Eligibility : A good academic record with M.A./M.Sc. or equivalent degree in Sociology/ Anthropology/ Economics/ History or any other subject in Social Sciences.

(e) **Psychology** : Cognitive Psychology, Organizational Psychology, Educational Psychology, Personality and Developmental Psychology.

Eligibility : A good academic record with M.A./M.Sc. in Psychology/Applied Psychology.

(f) **Human Genetics** : Epidemiology and genomics of HPV related cervical cancer, Epigenomics/genomics of oral cancer.

Eligibility : A good academic record with M.Tech./M.Sc. in Biochemistry/ Biophysics/ Molecular Biology/Genetics/Microbiology/Life-Sciences/Zoology/Biotechnology.

(g) **Biological Anthropology** : Medical Genetics, Population Genetics.

Eligibility : A good academic record with M. Sc. in Anthropology, specialization in Physical / Biological Anthropology / Human Genetics / Medical Genetics / Molecular Genetics.

(h) **Library and Information Science** (in Bangalore Centre)

Eligibility : A good academic record with Associateship in Documentation and Information Science of Indian Statistical Institute or INSDOC or Master's degree in Library and Information Science with at least 55% marks in under graduate and post graduate degree programme.

7.11.2.2 Selection Procedure

Subject to satisfying the eligibility criteria, the selection of candidates for JRF is strictly based on merit as judged by academic record, performance in selection tests and interviews.
The candidates who have been awarded fellowship by the CSIR/NBHM can seek an interview any time of the year and, on the basis of performance in the interview, are admitted as CSIR/NBHM fellows working at ISI.

7.12 Specialist Development Programme (SDP) in Statistical Quality Control and Operations Research

(This course will be notified separately.)

7.12.1 Scope

The programme is intended to develop professionally competent specialists in Quality Control and Operations Research and to provide careers as successful practitioners in the field through on-the-job training and guided development. The programme is offered at the SQC & OR Units of the Institute in Bangalore, Baroda, Mumbai, Kolkata, Coimbatore, Delhi, Hyderabad, Chennai and Pune.

7.12.2 Duration

The duration of the programme is two years. The programme generally starts in January every year.

7.12.3 Eligibility

Candidates with (a) consistently good academic record with (i) a first class or high second class Master's degree, or equivalent qualification in a relevant subject, or (ii) a good technological degree, and (b) Diploma in SQC & OR of the Indian Statistical Institute or at least one year's specialized post-graduate training in the field of SQC & OR in Industry with adequate applied work evidenced from certified project reports, are eligible. Both (a) and (b) are essential.
Holders of M.Tech.(QROR) degree of the Indian Statistical Institute may be admitted to the second year of the SDP.

7.12.4 Selection Procedure

All candidates are admitted through a selection test and an interview.

7.12.5 Programme Structure

The participants are given specific field assignments involving consultation, training, applied research etc. including responsibilities for independent projects, involving organization and development of QC systems. The programme consists of on-the-job training together with occasional refresher and development courses on various topics of importance to the profession.

7.12.6 Progress Appraisals

The progress of the participants is appraised from time to time both by their immediate supervisors and expert panels. At the end of the first year an annual evaluation and appraisal of the progress is done by expert teams. If the progress is found satisfactory the participant is promoted to the second year, otherwise the fellowship is terminated with immediate effect.
For further details of the programme the intending candidates should write to the Head, SQC and OR Unit, Indian Statistical Institute, 203 B.T. Road, Kolkata 700 108.

7.13 Courses of the International Statistical Education Centre (ISEC)

The International Statistical Education Centre (ISEC) is operated by the Indian Statistical Institute under the auspices of the Government of India. The main purpose of the Centre is to train selected officials, teachers and research workers from countries of the Middle-East, South and South-East Asia and the Far-East and from the Commonwealth countries of Africa. Training is imparted in theoretical statistics and various aspects of applied statistics. A 10-month regular course leading to Statistical Training Diploma is held from June every year. In addition, special courses of varying durations are sometimes organized in a particular field for individuals/small groups of individuals. Facilities are also available for advanced study and research work by senior statisticians from abroad.

The courses are open to Government-sponsored candidates only. Further information regarding this course may be obtained from Member-Secretary, Board of Directors, ISEC, Indian Statistical Institute, 203 B.T. Road, Kolkata 700 108.

7.14 Central Statistical Organization (CSO) Courses

These courses are organized by the Central Statistical Organization (CSO) of the Government of India, jointly with the Indian Statistical Institute, and are designed to equip statistical officers and probationers of the Indian Statistical Service with advanced methods and to enable them to undertake higher responsibilities in their departments.

Further information regarding the courses may be obtained from Director General, Central Statistical Organization, Jeevan Prakash Building, 25 Kasturba Gandhi Marg, New Delhi 110 001.

7.15 Doctoral Awards

7.15.1 Doctor of Philosophy (Ph.D.)

The degree of Doctor of Philosophy is awarded to a candidate for original contribution in a chosen field of research in the areas: Statistics, Mathematics, Quantitative Economics and Computer Science. For this purpose, it is necessary for the candidate to register for this degree under a supervisor and subsequently submit a thesis embodying his/her research work for evaluation by a panel of examiners.

Eligibility for registration as candidate for the Ph.D. degree **:** A candidate must satisfy all the three basic eligibility conditions I, II and III listed below in order to be considered for registration for the Ph.D. degree of the Indian Statistical Institute.

(I) At least one of (a) - (d) given below has to be satisfied.

(a) The candidate has successfully completed M.Stat., M.Math., M.S.(QE), M.Tech.(CS) or M.Tech.(QR&OR) course of the Indian Statistical Institute.

(b) The candidate has successfully completed the research programme of the Institute in a subject in which the Institute awards the Ph.D degree either as a regular research fellow of the Institute or as a research fellow in an externally funded project of the Institute. The Research Fellow Advisory Committee (RFAC) of the concerned Unit/Division has to certify that the candidate has successfully completed the research programme.

(c) The candidate has a Master's degree from a recognized university and has been a regular worker of the Institute or a project-linked person in an externally funded project of the Institute for at least three years and during this period has been engaged in research in a subject in which the Institute awards the Ph.D. degree. The RFAC of the concerned Unit/Division has to certify that the candidate has been engaged in research for at least three years.

(d) The candidate has a Master's degree or a four-year technological degree from a recognized university in a relevant subject and has been formally engaged in full-time research in a recognized research organization for at least three years after the qualifying degree. The candidate should have spent at least one of these three years at the Institute in a maximum of two spells. The association of such a candidate with the Institute for the purpose of satisfying the minimum one-year residence requirement has to be full time and formal, even if it is not on a stipendiary basis.

(II) Either the candidate has been admitted to the Institute as a research fellow through the selection test cum interview for Junior Research Fellows conducted annually by the Institute or he/she has successfully passed a written test cum interview conducted by the RFAC of the concerned Unit/Division of the Institute. The test conducted by the concerned RFAC will be at the same level and in the same syllabus as that of the normal JRF selection test in the subject in which ISI's Ph.D. degree is being sought. This condition also applies to candidates who have successfully passed the CSIR, NBHM or similar other tests for junior research fellowship.

(III) The candidate has sufficient knowledge of the relevant subject and has made substantial progress towards the submission of a thesis as evidenced by research papers published/accepted for publication in journals and/or working papers/preprints and a title and summary of the proposed thesis.

A candidate who has been selected as a junior research fellow of the Institute should apply for registration within five years from the date of selection. The thesis should be submitted within three years of registration.

7.15.2 Doctor of Science (D.Sc.)

This is an award for outstanding published work.

Eligibility : The D.Sc. degree is awarded only in exceptional cases on the basis of outstanding published work. Only those who satisfy one of the following requirements are considered for the award.

(i) B.Stat.(Hons.)/B.Math.(Hons.) degree or the Statistician's diploma of the Indian Statistical Institute and at least eight years of independent research work in Statistics.

(ii) M.Stat. degree or Certificate of successful completion of the Two/Three-year Advanced Statistician's Course of the Indian Statistical Institute and at least four years of independent research.

(iii) Ph.D. degree of the Indian Statistical Institute and at least two years of subsequent research.

(iv) At least eight years of research work in the field of Statistics after the Bachelor's degree of a recognized university or institute of which at least one year of work must be at the Indian Statistical Institute.

All correspondence regarding registration and other matters connected with Ph.D. and D.Sc. degrees may be addressed to Convener, Ph.D.-D.Sc. Committee, Indian Statistical Institute, 203 B.T. Road, Kolkata 700 108.

7.16 Research Associateship

The Institute recruits Research Associates from time to time, for its different Divisions/Units. This is done based on the availability of bright post-doctoral fellows having potential for being absorbed as lecturers in the Division/Unit.

8 Hostel

The Institute has hostels for male and female students in its premises in Kolkata, Delhi and Bangalore. However, it may not be possible to accommodate all degree/diploma students in the hostels. Limited medical facilities are available free of cost at Kolkata, Delhi and Bangalore campuses.

The Institute campus in Kolkata is about 12 km from the city centre; the Bangalore and Delhi campuses are about 20 km from the respective city centres.

9 Placement of Students

Students who have undergone the B.Stat.(Hons.), B.Math.(Hons.), M.Stat., M.Math., M.S.(QE), M.Tech.(CS), M.Tech.(QROR) and other degree, diploma/certificate courses of the Institute and those having the Ph.D. degree of the Institute are now well-placed in government and semi-government departments, public and private sector undertakings, industries and research/educational institutions, both in India and abroad. Most of the students of the Institute get employment offers or admission to some Ph.D. programmes even before they complete the qualifying degree examination.

There is a Placement Committee in Kolkata, which arranges campus interviews by prospective employers. Campus interviews are also organized at ISI Delhi.

10 INSTRUCTIONS FOR FILLING IN THE APPLICATION FORM [1]

10.1 Applicants are advised to study the prospectus carefully and satisfy themselves that they are eligible for admission to the course/fellowship for which they apply. If at any stage it is found that a candidate does not satisfy the eligibility conditions or the information furnished in the application is incorrect, the application will be cancelled. Those who have completed or are due to complete the qualifying examination for which results are not yet published, may also apply for admission; if selected, their admission to a course or fellowship will be provisional pending the announcement of results. In such cases, however, their application will be cancelled if the final examinations are not completed before **1 July 2007**. This date may be relaxed by the Institute in case of candidates with outstanding academic record and performance in the selection tests and interviews**. If a student fails a course of the Institute and is not allowed to repeat it, he/she is not eligible for re-admission to the same course.**

10.2 The application form should be filled in carefully, and legibly. Instructions given below should be strictly followed.

10.3 Do not write in the space marked **"*For office use only*"**.

10.4 Candidates should affix a copy of their recent stamp size photograph, at the top of the application form at the place indicated. Candidates should sign across the photograph at the bottom after it is affixed, so that a part of the signature appears outside the photograph. Please note that, **another identical copy** of the photograph is to be affixed on the Admit Card, when you receive it.

10.5 The following relate to specific items in the application form :

10.5.1 ***Items* 1 *and* 2.** Leave one box blank between words. The address to which you want letters to be sent is to be written here in CAPITAL LETTERS. **This address should also be written legibly in CAPITAL LETTERS on two (2)** $10.5'' \times 5.5''$ **envelopes without affixing any stamp and these envelopes are to be sent along with the application form duly filled in**. **The syllabus & sample questions and the admit card for the selection tests will be sent in this.**

10.5.2 ***Item* 3.** Choose the course (or fellowship) you want to apply for and write the corresponding code (see the table below) in the boxes provided. **Selection tests for the courses/fellowships will be held on the same day**. In view of this, candidates are advised to send ***only one application*** for the session **2007-2008**.

[1] Note : For admission to the M.Tech. in Computer Science, M.Tech. in Quality, Reliability and Operations Research, and Junior Research Fellowship, valid GATE or UGC/CSIR test scores are not necessary. All candidates including those with valid GATE or UGC/CSIR test scores have to take the selection tests of the Institute.

Candidates selected for Junior Research Fellowships may be asked to join at a place other than the one opted for, if necessary.

Code	Course
BSC	B.Stat.(Hons.) (Kolkata)
BMB	B.Math.(Hons.) (Bangalore)
MSC	M.Stat. (Kolkata)
MSD	M.Stat. (Delhi)
MMB	M.Math. (Bangalore)
MEC	M.S. in Quantitative Economics (Kolkata)
MED	M.S. in Quantitative Economics (Delhi)
MTC	M. Tech. in Computer Science
MTQ	M. Tech. in Quality, Reliability and Operations Research
ADI	Associateship in Documentation and Information Science (Bangalore)
	Junior Research Fellowship for Research Course in
JSC	Statistics (Kolkata)
JSD	Statistics (Delhi)
JSB	Statistics (Bangalore)
JMC	Mathematics (Kolkata)
JMD	Mathematics (Delhi)
JMB	Mathematics (Bangalore)
JEC	Quantitative Economics (Kolkata)
JED	Quantitative Economics (Delhi)
JCO	Computer Science
JGE	Geology
JPH	Physics and Applied Mathematics
JAE	Agriculture and Ecology
JSO	Sociology
JPS	Psychology
JHG	Human Genetics
JBA	Biological Anthropology
JLI	Library and Information Science (Bangalore)

10.5.3 ***Item*** **4**. Choose the examination centre where you want to appear for the selection test and write the corresponding code (see the table below) in the boxes provided. Selection tests for admission will be conducted at the centres given in the following table. Candidates should name three centres in their order of preference.

Code	Centre
BG	Bangalore
BP	Bhopal
BH	Bhubaneswar
BD	Burdwan
CC	Kolkata
CH	Chandigarh

Code	Centre
CN	Chennai
DH	Delhi
GT	Guntur
GH	Guwahati
HY	Hyderabad
KH	Kharagpur
LU	Lucknow
MB	Mumbai

Code	Centre
NG	Nagpur
PT	Patna
RN	Ranchi
SM	Sambalpur
SG	Siliguri
TR	Thiruvananthapuram
VN	Varanasi
VP	Visakhapatnam

10.5.4 ***Items*** **6-10.** Choose the alternative which applies to you and put a tick (✓) in the box provided.

10.5.5 ***Item*** **15(a).** It is most important to fill in this block accurately and completely. Do not forget to include details about the qualifying examination, which you have completed or are due to complete and for which results are not yet published. If you had

Mathematics or Statistics as a full subject of study at any stage, be sure to indicate it in the column marked "Subjects". **Do not send any original documents or copies with the application.**

10.5.6 ***Item*** **16.** In case you sent the downloaded application form (available in our website), please send the Bank Draft along with the filled in application form, after entering the Bank Draft details in **Item 16** in the application form.

10.6 Submission of application :

10.6.1 ***Two Self-addressed envelopes*** $(10.5'' \times 5.5'')$ are to be enclosed with the application form. The applicant should write *his/her address* legibly in CAPITAL LETTERS on these envelopes. Postal stamps need not be affixed. The Admit Card, sample questions etc. will be sent in these envelopes.

10.6.2 An Acknowledgement Card is attached with the application form. The applicant should write his/her address legibly on this and affix Rs.6/- stamp on the Acknowledgement Card.

10.6.3 The applicant must send the following documents:

(i) Application form duly filled in.

(ii) Two Self-addressed envelopes $(10.5'' \times 5.5'')$. ***Self- address must be written in CAPITAL LETTERS.***

(iii) Self-addressed Acknowledgement Card affixed with Rs.6/- stamp.

(iv) **Two** ***Self-addressed envelopes*** $(10.5'' \times 5.5'')$ ***and one self-addressed Post Card, only for those who will sent downloaded application form from the website (http://www.isical.ac.in/~deanweb). The downloaded application form should be sent along with a Bank Draft of Rs. 450/- drawn in favour of Indian Statistical Institute, payable at Kolkata (proper).***

The above items should be placed in the **white envelope** and the applicant must submit it personally or send by registered post with acknowledgement due, to reach us not later than **Friday, 23 March 2007.**

10.7 ***Item*** **14.** For M.Tech. in Computer Science, M.Tech. in Quality, Reliability and Operations Research, Part-time Certificate course in SQC* there is a provision for sponsorship of candidates by their employers. **In such cases Item 14 is to be filled in by the candidate and a separate letter in the format given at the end should be sent by his/her sponsor after consulting the prospectus (see section 10.13)**. PLEASE NOTE THAT FOR THE PART- TIME CERTIFICATE COURSE IN SQC*, SPONSORSHIP IS ESSENTIAL.

10.8 Incomplete or, illegible applications or, those received after the due date, will not be considered.

10.9 Completed applications should reach the following address by **23 MARCH 2007**.

DEAN OF STUDIES
Indian Statistical Institute
203 Barrackpore Trunk Road
Kolkata 700 108.

* See Section 2.

10.10 After the application is received by the Institute, the candidate will be allotted a Registration Number and asked to take the selection tests without verification of his/her eligibility. On the admit card will be marked the list of tests to be taken by the candidate as well as the address of the **Admission Test Centre**. In all subsequent correspondence, the applicant should quote the **Registration Number** without which no correspondence will be entertained.

10.11 Candidates who fail to appear at the selection tests will not be considered for admission. On the basis of the performance in the selection tests and past academic records, a limited number of candidates will be asked to appear at an interview for final selection subject to verification of their eligibility with reference to original documents.

10.12 Sample Questions and/or the Syllabi for the Selection Tests, Instructions to the Candidates and the Addresses of the Selection Test Centres are sent to the candidates along with the Admit Card after the applications are processed. The Selection Test is scheduled to be held on **Sunday, 06 May 2007**. *In case you do not receive the admit card* by **20 April 2007**, please inform the Dean of Studies. In the event of your not receiving the Admit Card by the date of the selection test, please proceed to the Admission Test Centre of your first preference, with any communication you have received from us, such as Acknowledgement Card etc.. Please take a recent stamp size photograph with you. You may be allowed to write the Admission Tests in case your name appears in the list of candidates sent to the supervisor of the Centre. The addresses of the supervisors and/or the Selection Test Centres are given separately.

10.13 Format for sponsorship letter :

We sponsor the application for Mr./Ms ……... for the …… course. If selected for admission, the applicant will be available to undergo training for a period of ……... years. We will abide by the conditions and rules for sponsored candidates mentioned in the prospectus.
A crossed cheque for Rs. ……. * in favour of `Indian Statistical Institute' will be sent positively before the commencement of the course. Further, for the Part-time Certificate Course in SQC[†], facilities will also be given in our organization for carrying out project work during normal working hours under the guidance of the faculty of the Institute.

Place . . . .
Date . . . . . Signature of the sponsoring authority
Designation . . . . . .
Address . . . . . .

* Please consult the prospectus for the duration, fees and other details for the course concerned.

[†] See Section 2.

Note **: "Any dispute concerning ADMISSIONS-2007 shall be settled in Kolkata subject to the Jurisdiction of Kolkata High Court."**

11 Addresses of Admission Test Centres

Addresses of Admission Test Centres are as follows. Applicants are also advised to check the **Admit Card** carefully for any last minute changes in the address of their test Centre.

BANGALORE (BG) :
Test Hall :
Sri Jagadguru Renukacharya
College of Science, Arts & Commerce
Sri Jagadguru Renukacharya Education-Society
No.9, Race Course Road,(Ananda Rao Circle)
BANGALORE 560 009
(Phone : (080)22260227)
Centre Supervisor :
Prof. I. K. Ravichandra Rao
Head, Bangalore Centre,
Indian Statistical Institute
8th Mile, Mysore Road
R.V. College P.O., Bangalore 560 059
(Phone : (080)28483002 to 006)
Fax.: (080) 28484265

BHOPAL (BP) :
Test Hall :
Crescent Institute of Management
Kolar Road Nayapura, opp. Fine Avenue
BHOPAL 462 042
(Phone : (0755)2879430)
Centre Supervisor :
Dr. O. P. Sarathe
Director (CIM)
[R/o 33. Phool Mahal Street, Retghat,
Bhopal - 462001
(Phone : (0755)2879430 (O))

BURDWAN (BD) :
Test Hall :
Vivekananda Mahavidyalaya, Burdwan
Main Building
P.O. Sripalli, Dist. Burdwan
BURDWAN 713 103
(Phone : (0342)2541208/2541521)
Fax: (0342)2646916
Centre Supervisor :
Dr. Pradeep Kumar Ghosh
Reader in Botany
72, Natunpalli,
P.O. + Dist. Burdwan
BURDWAN 713 101
(Phone : (0342)2569363, 9434667231)

BHUBANESWAR (BH) :
Test Hall :
Department of Statistics
Utkal University, Vani Vihar
BHUBANESWAR 751 004
Orissa, India
Centre Supervisor :
Prof. L. N. Sahoo
Department of Statistics
Utkal University,
Bhubaneswar 751 004
(Phone : (0674)2420529(R)/2583475(O))

CHANDIGARH (CH) :
Test Hall :
Department of Statistics,
Panjab University,
CHANDIGARH 160 014
(Phone : (0172)2534539/2541776)
Centre Supervisor :
Prof. Govind P. Mehta
G-6, Sector 14
University Campus
Chandigarh 160 014
(Phone : (0172)2547383)

CHENNAI (CN) :
Test Hall :
Loyola College
Nungambakkam
CHENNAI 600 034
(Phone : (044)28178200/28178302)
Centre Supervisor :
Dr. D. Sampangi Raman
Head, SQC & OR Unit , ISI
110, Nelson Manickam Road (I Floor)
Aminjikarai
Chennai 600 029
(Phone : (044)23740612/23740218/
23740371)
Fax : (044) 23740256

DELHI (DH) :
Test Hall :

1. Suraj Bhan D.A.V. Public School
   F-10/15, Vasant Vihar,
   (Near D Block Market)
   New Delhi 110 057
   (Phone : (011)26149082/ 26149371)

2. Sahoday School
   C-1, Safdarjung Development Area,
   (Near Jagan Nath Temple)
   New Delhi 110 016
   (Phone : (011)26512344)

3. M. B. D.A.V. Sr. Secondary School
   (Near A.I.I.M.S.)
   Yusuf Sarai
   New Delhi 110 016
   (Phone : (011)26512363/26537178)

Centre Supervisor :
Prof. Tridip Roy
Indian Statistical Institute
7, S.J.S. Sansanwal Marg
Near Qutab Hotel,
Opposite Katwaria Sarai
New Delhi 110 016
(Phone : (011)4149 3941)
Fax : (011) 4149 3981

GUWAHATI (GH) :
Test Hall :
Department of Statistics
Gauhati University
GUWAHATI 781 014
ASSAM
Centre Supervisor :
Prof. Dilip C. Nath
[Same address as test hall]
(Phone : (0361)2529857(R)/09435144485)
Fax : (0631)2700311

HYDERABAD (HY) :
Test Hall :
Little Flower Junior College
Uppal,
HYDERABAD 500 039
(Phone : (040)27201375)
Centre Supervisor :
Mr. A.L.N. Murthy
SQC & OR Unit , ISI
Street No. 8, Habshiguda
HYDERABAD 500 007
(Phone : (040)27171906/27153984)
Fax : (040) 27173602

GUNTUR (GT) :
Test Hall
Mahatma Gandhi College
N.G.O. Colony Road
Near New Pattabhipuram Railway Gate
GUNTUR 522 006
(Phone : (0863)2233953/2241381)
Centre Supervisor :
Prof. K. Chandan
Department of Statistics
Acharya Nagarjuna University
Nagarjuna Nagar 522 510
(Phone : (0863)2233287 (R))

KHARAGPUR (KH) :
Test Hall:
Hijli High School
IIT Campus, Kharagpur,
Dist.-Paschim Medinipur
Pin.-721 302
(Phone : (03222)277350)
Centre Supervisor :
Shri Tushar K. Samanta
Headmaster (Officiating)
Hijli High School
IIT Campus, Kharagpur,
Dist.-Paschim Medinipur
Pin.-721 302
(Mobile : 9434368672)

KOLKATA (CC) :
[See last page]

LUCKNOW (LU) :
Test Hall :
Department of Statistics
Lucknow University
LUCKNOW 226 007
(Phone : (0522)2740146)
Centre Supervisor :
Prof. R. K. Singh
Professor & Head
Department of Statistics
University of Lucknow
LUCKNOW 226 007
(Phone: ((0522)5532215(R)/2740146(O))
Mob. 09335259636)

NAGPUR (NG) :
Test Hall :
Dept. of Management Studies & Research,
3rd Floor, Tirpude College of Social Work,
Civil Lines,
NAGPUR 440 001
(Phone : (0712)2525781)
Fax: (0712)2543965
Centre Supervisor :
Dr. A. S. Ukhalkar
11, Chetna, 134 Farmland ,
New Ramdaspeth, Nagpur 440 010
(Phone Res. : (0712)2543042)

MUMBAI (MB) :
Test Hall :
R.A. Podar College of Commerce & Economics
Lakhamshi Napoo Road,
Matunga (C.R.)
MUMBAI 400 019
(Phone : (022)24143178)
Centre Supervisor :
Sri Ashok Sarkar
Bldg. No. A/8, Flat No. 407
Yogi Dham, Kalyan Murbad Road,
Behind Anupam Nagar.,
Kalyan (West)
(Phone : (0251)2321410 (R))

PATNA (PT) :
Test Hall :
Rabindra Balika Vidyalaya
Road No. 2, Rajendra Nagar
PATNA 800 016
(Phone : (0612)2671159)
Centre Supervisor :
Prof. Prabhat P. Ghosh
Asian Development Research Institute,
BSIDC Colony,
Off Boring-Patliputra Road,
Patna – 800 013
(Phone : (0612)2265649/2267773 (O)/
2673695 (R) / 9431024906 (M))

RANCHI (RN) :
Test Hall :
Army School, Ranchi
Rameswaram Line,
Bariatu Road
Ranchi 834 009
Phone/Fax: (0651) 2541961 (O)
Centre Supervisor :
Dr. Kishore Sinha
Ranchi Agriculture College
Kanke,
Ranchi 834 006
(Phone : (0651)2450169 (R))

SAMBALPUR (SM) :
Test Hall :
Department of Statistics
Sambalpur University, Jyoti Vihar
Sambalpur 768 019
ORISSA
Phone : (0663)2431735
Fax: (0663)2430158
Centre Supervisor :
Prof. Kruttibas Dutta,
Professor of Statistics,
Department of Statistics
Sambalpur University, Jyoti Vihar
Sambalpur 768 019,
ORISSA
(Phone : (0663)2430131(R))

SILIGURI (SG) :
Test Hall :
Department of Political Science
University of North Bengal
P.O. North Bengal University
Dist. Darjeeling
DARJEELING 734 430
(Phone : (0353)2699119/2699447(O))
Fax : (0353)2699001
Centre Supervisor :
Dr. Manas Chakraborty
Professor & Head
Department of Political Science
University of North Bengal
P.O. North Bengal University
Darjeeling 734 430
(Phone : (0353)2581322(R),9434186555(M))

VARANASI (VN) :
Test Hall :
Sankhyiki Bhawan,
Department of Statistics,
Banaras Hindu University
VARANASI 221 005
U.P.
(Phone : (0542)2307330,31)
Centre Supervisor :
Dr. Umesh Singh
Head, Department of Statistics,
Banaras Hindu University
VARANASI 221 005
(Phone : (0542)2575735(R),
(0542) 2307331 (O))

VISAKHAPATNAM (VP) :
Test Hall :
Department of Statistics
Andhra University
WALTAIR 530 003
(Phone: (0891)2844646)
Centre Supervisor :
Prof. M. Chitti Babu
2 Sea Sands Qtrs.
Opp. A.U. Inagate
Andhra University
WALTAIR 530 003, A.P.
(Phone (0891) 2526945(R),
Cell 9441140847)

THIRUVANANTHAPURAM (TR) :
Test Hall :
Government College,
Kariavattom,
THIRUVANANTHAPURAM 695 581
(Phone : (0471)2417112)
Centre Supervisor :
Mrs. Treesamma George,
Principal,
Government College,
Kariavattom,
THIRUVANANTHAPURAM 695 581
(Phone : (0471)2417112 (O))

KOLKATA (CC) :
Test Halls :
1. Ananda Ashram Sarada Vidyapeeth
   104 , B. T. Road, Bonhoogly
   KOLKATA 700 108
   (Phone : (033)25772415)

2. Prasanta Chandra Mahalanobis
   Mahavidyalaya
   111/3, Barrackpore Trunk Road
   KOLKATA 700 108
   (Phone : (033)25772479)

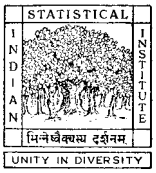
3. St. Paul's School, (Higher Secondary)
   33/1, Raja Ram Mohan Sarani
   (Amherst Street)
   KOLKATA 700 009
   (Phone : (033)23502499)

4. St. Xavier's College
   &
   St. Xavier's Collegiate School
   30, Park Street
   KOLKATA 700 016
   (Phone : (033)22872484/7276)

A booklet entitled

TEST OF MATHEMATICS AT THE 10+2 LEVEL

consisting of a collection of questions of the B.Stat.(Hons.) admission tests of the past twenty years, collated and edited by the faculty of the Institute, has been published by **Affiliated East-West Press Pvt. Ltd. .**



Printed at Publication and Printing Unit, ISI, 203 B.T. Road, Kolkata 700 108