INDIAN STATISTICAL INSTITUTE

PROSPECTUS
2013-2014

203 BARRACKPORE TRUNK ROAD
KOLKATA 700 108

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1. Introduction

The Indian Statistical Institute, known widely as ISI, was founded in 1931 by Professor Prasanta Chandra Mahalanobis. Growing out of a small Statistical Laboratory set up by Professor Mahalanobis in the Presidency College in Kolkata, the Institute soon moved into its present campus at Baranagore in the northern outskirt of Kolkata. Over the last eighty years since that humble beginning, the Institute has undergone a phenomenal growth and is now widely regarded as one of the leading institutions in the world as a centre for research and training in Statistics and related sciences.

In recognition of the importance of the Institute in the development and application of Statistics, the Parliament of India, in 1959, enacted the Indian Statistical Institute Act, declaring it an Institution of National Importance and empowering it to grant degrees and diplomas in Statistics. In 1995, The Indian Statistical Institute Act was further amended, empowering it to grant degrees and diplomas also in Mathematics, Quantitative Economics, Computer Science and such other subjects related to Statistics as may be determined by the Institute from time to time.

The headquarters of the Institute is located in Kolkata. However, centres of the Institute have come up over the years in other major cities. At present, the Institute has four centres operating at Delhi, Bangalore, Chennai and Tezpur. Recently, the Institute has decided to open a centre at Bhubaneswar. In addition, the Institute has a branch at Giridih devoted to agricultural and sociological research and also a network of units at Coimbatore, Hyderabad, Mumbai and Pune, involved in activities related to Statistical Quality Control and Operations Research.

Most of the research and teaching activities of the Institute take place in its headquarters in Kolkata and the four centres. In Kolkata, Delhi and Bangalore, the Institute has its own campus and they are equipped with adequate hostel facility for students, residential quarters for the faculty and guest houses, and also recreational and medical facilities. The relatively new centres at Chennai and Tezpur are still operating at temporary locations. However, at these centres also, the Institute is providing hostel facility for students and residential facility for faculty members. At each of these five locations, there are a large number of scientists in theoretical and applied Statistics, statistical quality control and operations research, mathematics and economics. In Kolkata, there is also a large group of scientists in Computer and Communication Sciences and other branches of natural and social sciences.

A sizeable proportion of the students passing out of the Institute go on to building remarkably successful career in research and academics. Some of the most eminent and leading researchers and academics in the fields of Statistics, mathematics, computer science and economics are alumni of the

Institute. But simultaneously, the students of the Institute who have gone into industry have also been extremely successful. A number of top and well-accomplished leaders in the industry are also alumni of the Institute.

For many years now, the Institute has been running a very proactive on-campus placement programme. Under the supervision of a member of the teaching faculty, this programme has been very successful in providing the aspiring students, in the final years of their respective programmes, excellent placement opportunities in some of the leading organisations in various sectors of the industry. The companies that have already visited the Institute's campus in Kolkata this year are:
TCS ANALYTICS, MCKC, AXIS BANK, MORGAN STANLEY, SABRE HOLDINGS, POLYCOM, GENPACT ANALYTICS, HSBC, INNOPARK, SP ALGO, IDEA CELLULAR, NOVARTIS, FRACTAL ANALYTICS, INFOSYS, TCS INNOVATION LABS, OPERA SOLUTIONS, GOLDMAN SACHS, HP, JPMC, EI. Some more companies are lined up to come during the remaining part of this academic year. In addition, students have received pre-placement offers from DELOITTE and GE.

Over the last several years, the Institute has been very actively pursuing institution-level collaborations that have resulted in entering into MOUs with a number of universities/academic institutions as well as industrial organisations. These MOUs range from collaborative research to research grants for students/faculty as well as student/faculty exchange programmes. At present, the Institute has MOUs signed with the following institutions/ organisations:
IBM INDIA PVT LTD, CHENNAI MATHEMATICAL INSTITUTE (CMI), TEOCO, TEXAS INSTRUMENTS PVT LTD, BIRSA AGRICULTURAL UNIVERSITY, SETS, HOMI BHABHA NATIONAL INSTITUTE, NATIONAL UNIVERSITY OF SINGAPORE, NORTH CAROLINA STATE UNIVERSITY, MAASTRICHT UNIVERSITY-NETHERLANDS (JOINT PH D PROGRAMME), TECHNOLOGICO AUTONOMO DE MEXICO-ITEM, TATA INSTITUTE OF FUNDAMENTAL RESEARCH (TIFR), TATA CONSULTANCY SERVICES LTD (TCS), DE BEERS INDIA PVT. LTD., DST INDO GERMAN MAX-PLANCK CENTRE, IISCO (STEEL AUTHORITY OF INDIA LTD.), INTERNATIONAL GROWTH CENTRE, FICO, TECH MAHINDRA, BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES, ECOLE POLYTECHNIQUE MASSTRO, THE WARWICK UNIVERSITY, INSTITUTE OF FINANCIAL MANAGEMENT RESEARCH (IFMR), MCX STOCK EXCHANGE LTD., THE INSTITUTE OF ASIA-PACIFIC STUDIES, WASEDA UNIVERSITY.

2. A Brief History of the Institute

The Indian Statistical Institute had its beginning in a small statistical laboratory set up by Professor Prasanta Chandra Mahalanobis in the Presidency College at Kolkata, where he was then a professor of Physics. In a meeting held on 17th December 1931 and presided over by Sir R N Mukherjee, the first President of the Institute, the Indian Statistical Institute (ISI) was formally

established and Prasanta Chandra Mahalanobis was appointed the Honorary Secretary. The Institute was registered on 28th April, 1932, as a non-government and non-profit learned society under the Societies' Registration Act No. XXI of 1860. The Institute is now registered under the West Bengal Societies Registration Act XXVI of 1961, amended in 1964. The major objectives of the Institute, as stated in its Memorandum, are:

(i) 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 for national development and social welfare;

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

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

With its humble start in a laboratory in the Presidency College, the Institute soon embarked upon a remarkable journey with enduring support from a number of distinguished personalities and devoted scholars in Kolkata. Over its first two decades, which was a glorious chapter in the annals of Indian science and institution building, the ISI undertook a series of pioneering programmes involving application of Statistics in search of solutions to some of the urgent and live problems of the country. Such programmes included innovative projects on sample surveys of yield and land utilisation of crops, socio-economic after-effects of Bengal famine (1943-44) and problems of flood research, to name a few. Simultaneously, led by Professor Mahalanobis, path-breaking theoretical research was carried out by a very able group of young statisticians including R C Bose, S N Roy and C R Rao. These innovations and methodological research have since become classics in Statistics. All these activities brought laurels for the Institute in India as well as abroad.

Over several decades after its inception, the Institute made steady strides to establish its identity as a pioneering organisation nationally as well as internationally. Some of the principal achievements of this period include the establishment of

(i) a full-fledged research and training school in Statistics and Probability with applications in natural and social sciences,

(ii) publication of *Sankhya*, the first international journal of Statistics in India,

(iii) the National Sample Survey wing engaging in comprehensive socio-economic data collection for the nation,

(iv) a string of Statistical Quality Control units for promoting the quality movement at various industrial centres in the country and

(v) a collaboration with the International Statistical Institute to train Government statisticians from Asia and Africa.

One of the most significant contributions of the institute in India's nation-building came when, in 1954, Pandit Jawaharlal Nehru, the then Prime Minister of India, entrusted Professor Mahalanobis and ISI with the responsibility of preparing the draft Second Five-Year Plan for the country. The institute established a planning wing dedicated to the formulation of the Second Five-Year Plan of India. The draft submitted by Prasanta Chandra Mahalanobis and the planning models formulated by him and his colleagues have since been regarded as major contributions to economic planning in India. As another remarkable achievement, the Institute, in 1956, installed the first electronic computer in the country. In 1961, the ISI, in collaboration with Jadavpur University, undertook the design, development and fabrication of a fully transistorised digital computer, called ISI-JU-1, which was commissioned in 1966. The institute had established an Electronic Computer Laboratory that was responsible for developing

a) the first mechanical hand computing machine,
b) the first Analog computer,
c) the first Punched Card storing machine and
d) the first Solid State Computer in India.

The Institute, from its formative period till the recent time, received as guests many eminent scientists, including Nobel Laureates. Besides Sir Ronald A Fisher, JBS Haldane and Walter A Shewhart, the luminaries included Frederic and Irene Curie, Neils Bohr, AN Kolmogorov, PMS Blackett, JD Bernal, Joan Robinson and Genedi Taguchi. In recent times, the visit of Amartya K Sen, Robert Aumann, Lotfi A Zadeh, Joseph E Stiglitz, Sir James A Mirrlees and SRS Varadhan, 2007 Abel Prize winner for his contributions to probability theory and an alumnus of the institute, may be especially mentioned.

The Institute has always had its Headquarters in Kolkata since the beginning till date. Later, the Delhi Centre, initially housed within the Planning Commission premises, was started in 1974, and shifted to its present campus in 1975. The Bangalore Centre was conceived by Professor P C Mahalanobis during 1960s. With the Statistical Quality Control unit functioning in Bangalore from 1956, and Documentation Research and Training Centre from 1962, Professor Mahalanobis thought of starting a centre of ISI around the mid-1960s. However, the activities of the Bangalore Centre started in September 1978 in a rented building under the Directorship of Professor G Kallianpur. The Bangalore Centre was formally declared as a centre of ISI in September 1996. The newly created Chennai Centre of the Institute, which came into being on 26th July, 2008, and the North-East (NE) Centre at Tezpur, Assam, which was inaugurated on July 23, 2011, are expected to carry out research in theory and applications of Statistics in the

new areas of natural and social sciences. The NE Centre is also committed to cater to the statistical needs of the North-Eastern states, including training statistical personnel.

The Institute has a distinguished faculty as well as an excellent library and modern computer facilities. A large number of Indian statisticians, probabilists and mathematicians, who have won international fame, have been alumni of the Institute. The Abel laureate Prof S R S Varadhan received his Ph D degree from the Institute in 1963. In addition to well-acclaimed statisticians and mathematicians, the Institute also has as its faculty several distinguished computer scientists, economists and scientists of other fields. A large number of the institute's faculty-members are fellows of distinguished scientific societies in India and abroad and recipients of S S Bhatnagar Award, G D Birla Award for Scientific Research, Mahalanobis Memorial medals etc. The Institute is engaged in significant research activity not only in the core areas of Statistics, Mathematics, Computer Science and Economics, but also in many other disciplines, such as, Population Studies, Physics, Agricultural and Ecological Sciences, Geology, Biological Anthropology, Human Genetics, Linguistics, Psychometry and Sociology, with due emphasis on inter-disciplinary research and collaborative work with the statisticians of the Institute. The Institute thus conjures a symbiosis of pure, applied and interdisciplinary research involving various areas of Statistics, Mathematics, Quantitative Economics, Computer Science, other natural and social sciences, Statistical Quality Control and managerial decision making. This has been reflected in the research, teaching and training programmes of the Institute.

The formal empowerment of the Institute for awarding of degrees came in December 1959, when Pandit Jawaharlal Nehru piloted in the Parliament the enactment of the Indian Statistical Institute Act of 1959, which designated ISI as an 'Institution of National Importance'. The activities steadily grew, existing interests became more broad-based and a number of science units were created in the interest of live interaction between Statistics and natural and social sciences. Empowered by the Act to award degrees, the Institute introduced the Bachelor of Statistics (Honours) and Master of Statistics courses in 1960 under the guidance of Professor Mahalanobis and stalwarts like Professor Satyendra Nath Bose who was the President of the Institute for a long period of time, 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 Institute also introduced research programmes leading to the Ph D degree from the Institute. After the subsequent amendment of the Indian Statistical Institute Act in 1995, broadening its scope of degree-awarding, the institute introduced other

degree programmes, namely, Master of Science (Quantitative Economics) (in 1996-97), Bachelor of Mathematics (Honours) (in 2000-01) and Master of Mathematics (in 2003-04).

The Institute has been using computers since the early fifties. The Computer Science faculty is among the finest in the country. A one-year Diploma in Computer Science was started in the Institute in 1966. This was upgraded to a two-year Diploma in 1978, which evolved into the current M Tech programme in Computer Science in 1981, the first such programme in the country.

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.*, Mathematics, Economics, Computer Science & Electronics, Earth Science, Life Science, Physics, Quality Control, etc. In addition to a total volume of more than three lakhs comprising books, bound journals, official reports/ data-books, dissertations and theses, reprints, non-print materials such as CDs/floppies, microfilms and microfiches, it maintains online access to journals and all the major scientific publication databases. It has also a separate NBHM collection funded by National Board for Higher Mathematics, Department of Atomic Energy, Government of India. It is making endeavours to create institutional repositories using open source software facilitating access to indigenous resources across regions and increasing the visibility of such resources. As a part of the Central Library, the renovated *Amrapali* building which was the residence of the founder of the Institute, now houses P C Mahalanobis Memorial Museum and Archives. The Institute has been offering a course leading to Associateship in Documentation and Information Science at the Bangalore Centre since 1965-66. This course has been upgraded to a Master's level course, called the Master of Science in Library and Information Science [MS (LIS)] since 2008-09.

The International Statistical Education Centre (ISEC), established in 1950, is run by the Institute under the auspices of the Government of India. This Centre has been providing training in Statistics to sponsored students mainly from countries of the Middle-East, South and South East Asia and the Far East and from the Commonwealth countries of Africa. The Centre also offers various short-term courses in Statistics and related subjects.

3. Current Academic Programmes

	PROGRAMME	DURATION	VENUE FOR 2013-14
Degree Programmes	B Stat (Hons)	3 years	Kolkata
	B Math (Hons)	3 years	Bangalore
	M Stat	2 years	Delhi & Chennai
	M Math	2 years	Bangalore
	MS (QE)	2 years	Kolkata & Delhi
	MS (LIS)	2 years	Bangalore
	M Tech (CS)	2 years	Kolkata
	M Tech (QROR)	2 years	Kolkata
Diploma/ Certificate	Part-time Course in SQC*	6 months	Bangalore & Hyderabad
	Postgraduate Diploma in Statistical Methods with Applications*	1 year	Tezpur
Fellowship	Junior/Senior Research Fellowship	6 years	Kolkata, Delhi, Chennai, Bangalore & Hyderabad
	Specialist Development Programme in SQC & OR (SDP)*	2 years	Bangalore

The Institute awards Ph D/D Sc degrees for research in the fields of Statistics, Mathematics, Quantitative Economics, Computer Science, and Quality, Reliability and Operations Research (QR&OR).

* For the academic year 2013-2014, these courses will be notified separately, if offered.

4. Admission Procedure

Admission to the academic programmes of the Indian Statistical Institute is based strictly on the merit of the candidates as judged from their performance in appropriate selection tests and interviews. Their past academic records may also be taken into account for this purpose. The selection tests are held at a number of centres in India. Section 5 gives details of scope, eligibility criteria and selection procedures 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.

Reservation

For admission to all its programmes (except the Research Fellowships), the Institute follows a policy in order to ensure reservation for Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC) and Physically Challenged (PC) categories, as per the policy of the Government of India. Candidates from these reserved categories also enjoy some other benefits in respect of charges, stipend, hostel accommodation and travelling allowance (the details are given at the website *http://www.isical.ac.in/~deanweb*).

SC, ST and OBC candidates will be required to produce the original caste/tribe certificate issued by a competent authority in the prescribed format (see *http://www.upsc.gov.in/recruitment/scst.htm* as well as *http://www.iitg.ernet.in/jee/OBC_format.htm*)**. These documents must be produced at the time of interview, failing which the candidate will not be considered for admission. For any category of physical disability (namely, locomotor, visual, speech and hearing), benefit will be given to those candidates who have at least 40% permanent physical impairment in relation to a body part/system/extremity/extremities/whole body, etc. The candidates in this category will be required to produce a certificate issued by a competent authority** (mentioned in *http://nhrc.nic.in/Publications/DisabledRights.pdf*) **in the prescribed format** (see *http://upsc.gov.in/recruitment/med-handi.htm*)**. These documents must be produced at the time of interview, failing which they will not be considered for admission.**

The decisions of the Institute in all 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 also of those selected after interview are generally posted on the internet at the site: *http://www.isical.ac.in/~deanweb*.

If a student fails in a programme and has been asked to discontinue the programme, he/she is not eligible for readmission to the same programme.

For 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 syllabi for the selection tests for the different courses and fellowship programme are sent to the candidates along with admit cards after the applications are processed. Sample questions of last few years for some of the programme are available at the website** *http://www.isical.ac.in/~deanweb.**

5. Academic Programmes: Scope, Eligibility and Selection Procedures

- **Bachelor of Statistics (Honours) [B Stat (Hons)]**

Scope

This **three-year** 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 described in Section 7. It is so designed that, on successful completion, the students will 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. This programme is offered only at **Kolkata**.

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.

Selection Procedure

All candidates applying for admission to this programme, except the INMO AWARDEES (see next paragraph), will have to appear for written tests comprising multiple-choice type and short-answer type questions in Mathematics at the Higher Secondary level (10+2 years' programme). Based on performance in the written tests, a number of candidates are called for interviews.

The written test is **waived** for candidates who have been selected as **INMO AWARDEES** to participate in the International Mathematics Olympiad Training Camp (IMOTC) in the current year or in any previous year, based on their performance in the Indian National Mathematics Olympiad (INMO) conducted by the National Board of Higher Mathematics, Department of Atomic Energy, Govt. of India. Such candidates will be directly called for interviews. However, like all other candidates, such candidates are also

required to apply in the prescribed application form for admission to the programme. **Merely holding an INMO Certificate of Merit from Homi Bhaba Centre for Science Education (HBCSE) will not suffice for waiver of written tests for selection to the programme.**

The final selection of candidates for admission to the programme is based on performances in the two written tests as well as the interviews (only interviews for INMO AWARDEE applicants) and the final list of candidates selected for admission is announced after completion of all the interviews.

A candidate who has applied to the B Stat (Hons) programme shall have only one option at a subsequent stage to seek admission to the B Math (Hons) programme of the Institute. Candidates desirous of exercising this option must inform the Dean of Studies of their decisions either in writing or by sending an e-mail to *isiadmission@isical.ac.in* ***by May 20, 2013.***

- **Bachelor of Mathematics (Honours) [B Math (Hons)]**

Scope

This **three-year** 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 will 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. This programme is offered only at **Bangalore**.

Eligibility & Selection Procedure

Same as B Stat (Hons) above. In fact, the written test is a common one for both the courses.

A candidate who has applied to the B Math (Hons) programme shall have only one option at a subsequent stage to seek admission to the B Stat (Hons) programme of the Institute. Candidates desirous of exercising this option must inform the Dean of Studies of their decisions either in writing or by sending an e-mail to *isiadmission@isical.ac.in* ***by May 20, 2013.***

- **Master of Statistics [M Stat]**

Scope

This **two-year** programme offers advanced-level training in the theory, methods and applications of Statistics along with specialised training in selected areas of Statistics and allied fields. On successful completion of this programme, students will be able to pursue an academic/research career in Statistics, Mathematics, Economics, Computer Science and allied fields, depending on their chosen area of specialisation. They will also be able to

work competently as Statisticians and specialists in research institutions and scientific laboratories, government departments or industries. This programme is being offered this year at **Chennai** and **Delhi**.

Eligibility
In order to be eligible for admission to this programme, an applicant must have

- a three-year Bachelor's degree with Statistics as a full subject, or
- a B Stat/B Math degree from ISI.
- a Statistician's Diploma/Senior Diploma/Post-Graduate Diploma in Statistical Methods with Applications from ISI.

Selection Procedure
Students with B Stat (Hons) degree from ISI are offered direct admission to this programme at Kolkata without any selection test or interview. For all other eligible candidates, including students with B Stat (Pass) degree from ISI, selection for admission to this programme is based on performance in written selection tests and subsequent interview. Past academic record may also be taken into consideration.

The written selection tests consist of

- a test comprising multiple-choice and/or short-answer questions in Mathematics at the undergraduate level, and
- a test comprising multiple-choice and/or short-answer questions in Statistics and Mathematics at the undergraduate level, designed to assess competence in the theory and methods of Statistics and comprehension in Mathematics.

• Master of Mathematics [M Math]

Scope
This **two-year** programme offers advanced-level training in Mathematics. On successful completion of the programme, students will be able to pursue a research/academic career in Mathematics. Depending on the choice of the optional subjects, the students will also be able to work in the fields of Probability Theory and Theoretical Computer Science. It is being offered this year only at **Bangalore**.

Eligibility
In order to be eligible for admission to this programme, a student must have

- a three-year Bachelor's degree or a BE/B Tech Degree, with Mathematics and **an exceptionally strong background in Analysis and Abstract Algebra,** *or*
- a B Stat/B Math degree of ISI.

Selection Procedure
Students with B Math (Hons) degree from ISI are offered direct admission to this programme without any selection test or interview. For all other eligible candidates, including students with B Math (Pass) degree from ISI, selection for admission to the programme is based on performance in written selection tests and subsequent interview. Academic record may also be taken into consideration.

The selection tests will comprise multiple-choice and/or short-answer type questions in Mathematics at a level corresponding roughly to the Mathematics Honours/Major of Indian universities, with special emphasis on Real Analysis, Linear and Abstract Algebra.

- **Master of Science in Quantitative Economics [MS (QE)]**

Scope
This is a **two-year** advanced programme in Economics and its applications, with special emphasis on quantitative methods. On successful completion of the programme, a student will be able to pursue an academic career in Economics or take up responsible positions in various private and public sector organisations. It is offered at **Kolkata** and **Delhi**.

Eligibility
In order to be eligible for admission to this programme, an applicant must have

- a three-year Bachelor's degree in Economics/Mathematics/Statistics/ Physics, or
- a B Stat degree from ISI, or
- a BE/B Tech degree with knowledge of Economics and Mathematics at the undergraduate level.

Selection Procedure
Selection of candidates to this programme will be based on performance in written tests and subsequent interview. Academic record may also be taken into consideration. The selection tests will comprise multiple-choice and/or short-answer questions in **both Economics and Mathematics at the undergraduate level.**

- **Master of Science in Library and Information Science [MS(LIS)]**

Scope
This is a **two-year** advanced programme in Library and Information Science, with special emphasis on applications of information technology. On successful completion of this programme, a student will be able to pursue an academic career or take up responsible positions in various private and

public sector organisations in the Library and Information fields. The objectives of this programme are to develop manpower capable of

- effectively and efficiently working as information professionals at higher levels in libraries and information centres;
- design and development of information systems;
- contributing to the discipline of Library and Information Science in terms of research and teaching.

This programme is offered only at **Bangalore.**

Eligibility
The minimum qualification for admission to this programme is a three-year undergraduate degree in any discipline.

Selection Procedure
Selection of candidates will be based on performance in written tests and subsequent interview. Academic record may also be taken into consideration.

- **Master of Technology in Computer Science [M Tech (CS)]**

Scope
This **two-year** programme is designed to provide a balance of theoretical and professional training in Computer Science and Technology so that the students, on successful completion of the programme, may take up

- a professional career in the technology of software for computer systems or specialised application areas, or
- an academic career for further study and research in the fundamental and applied aspects of Computer Science and Technology and related disciplines.

This programme is offered only at **Kolkata**.

Eligibility
A candidate seeking admission to this programme should possess

- a Master's degree in Mathematics/Statistics/Physics/Electronic Science/Computer Science/Computer Applications/Information Technology, or
- a BE/B Tech degree or any other qualification considered equivalent (such as AMIE or, GRADIETE or, DOEACC 'B' Level).

Selection Procedure
A candidate is admitted to this programme through written tests and interview. A few candidates may be sponsored by government, semi-government, public sector undertakings and autonomous institutions but such candidates will also 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 granted leave and full salary by the employer for the entire duration of the course. Sponsored candidates will not receive any stipend and their sponsors will have to pay a tuition fee of ₹ 20,000/- per year.

The selection test typically consists of two parts:

(i) an multiple-choice and/or short-answer type test in Mathematics at the undergraduate level;

(ii) an multiple-choice and/or short-answer type test comprising the following:

Group A: A test for all candidates in Mathematics at the undergraduate level and in logical reasoning.

Group B: A test, divided into five sections carrying equal marks, in Mathematics, Statistics and Physics at the postgraduate level and in Computer Science, Engineering and Technology at the B Tech level. Candidates must answer questions from any one of these sections.

A candidate with a valid GATE score above a threshold (to be decided by the Selection Committee) in his/her own subject will be directly called for interview. Final selection of such candidates would be based on their academic records and their performance in the interview. These candidates are required to apply, like all other candidates, in the prescribed application form.

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

Scope

This **two-year** full-time programme is intended to develop specialists in Quality Management with emphasis on Statistical Quality Control, Reliability, Operations Research, Computer Engineering 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 a methodical approach to solving live industry problems of quality, reliability and productivity. Apart from classroom instruction, every student is required to do a dissertation and project work on live problems of industry directly under the guidance of the faculty of ISI. This programme is offered only at **Kolkata**.

Eligibility

A candidate seeking admission to this course

- must be conversant with the following topics :
  - Mathematics (at the postgraduate level);
  - Physics and Chemistry (at the higher secondary (10+2) level);
- must possess any of the following minimum qualifications:
  (i) a Master's Degree in Statistics;

(ii) a Master's Degree in Mathematics with Probability and Statistics as major subjects;
(iii) a BE/B Tech degree or any other qualification considered equivalent;
(iv) a postgraduate diploma in SQC & OR from ISI.

The programme is offered in two streams:

Statistics Stream for candidates with qualifications (i), (ii), or (iv), mentioned above;

Engineering Stream for candidates with an undergraduate degree in Engineering or Technology as in (iii) above.

Selection Procedure

All candidates, including sponsored ones, are admitted through written tests and interview. For admission to this course, valid GATE score is not necessary, and candidates with valid GATE scores also must take the written tests. There is, however, a provision for sponsorship by government, semi-government, public sector undertakings, autonomous institutions and industrial organisations, which can sponsor candidates from their establishments, 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 gives him/her leave and full salary for the entire duration of the programme. Sponsored candidates will not receive any stipend and their sponsors will have to pay a tuition fee of ₹ 20,000/- per year.

The selection test consists of two parts:

(a) an multiple-choice and/or short-answer type test in Mathematics at the undergraduate level;
(b) an multiple-choice 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. Candidates must answer questions from both the sections.

Part II (for Engineering Stream): A test divided into several sections: Mathematics, Engineering Mechanics, Electrical & Electronics Engineering, Thermodynamics, Engineering Properties of Metals, and Engineering Drawing. A student has to answer questions from Mathematics section compulsorily and the remaining questions from two or more sections of his/her choice.

- **Postgraduate Diploma in Statistical Methods with Applications**[†]

Scope

The course is intended to provide students with a comprehensive yet thorough training in basic theory, methods and applications of Statistics, in addition to some exposure to Mathematics and Computer Science. It is so designed that on successful completion, the students will be able to take up jobs as statisticians in such departments of government and industries where application of Statistics is required, and also teach Statistics competently at the 10+2 level in schools. The one-year rigorous training, as is the tradition of the Institute, will also prepare the students for advanced level post-graduate courses. The total duration of this programme is **one year**, and it is offered at the North-East centre of the institute at **Tezpur, Assam.**

Eligibility

In order to be eligible for admission to this programme, a student must have

- a 3-year Bachelor's degree with Mathematics as one of the subjects at the undergraduate level, or
- a B Tech/BE degree.

Selection Procedure

Selection of candidates to this diploma course will be based on performance in written test(s) and interview. Past academic record may also be taken into consideration. The selection test(s) will comprise multiple-choice and/or short-answer questions in Mathematics at pass/minor level of Bachelor's degree.

- **Junior/Senior Research Fellowships (JRF/SRF)**

I. Research Fellowships in Statistics, Mathematics, Quantitative Economics, Computer Science, and Quality, Reliability & Operations Research (QROR)

Scope

The Institute offers Junior Research Fellowships to candidates in Statistics, Mathematics, Quantitative Economics, Computer Science, and Quality, Reliability and Operations Research (QROR). A candidate admitted as a Junior Research Fellow, barring few exceptions described in the Students' Brochure, and applying for registration for Ph D in the relevant discipline, will be required to successfully complete mandatory course-work involving at least five courses from the list of courses for that discipline. He/she is

[†] For the academic year 2013-2014, this course will be notified separately.

expected to 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 the Ph D degree of the Institute. Candidates making satisfactory progress towards the above goal are eligible to register for the Ph D degree of ISI. 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 6 years**.

An enhanced Special Research Fellowship is also available for outstanding candidates in the above disciplines.

Centres

The names of the centres along with the respective subjects in which junior/ senior research fellowships are being offered this year are given below.

Centre	Subject
Kolkata	Statistics, Mathematics, Quantitative Economics, Computer Science, Quality, Reliability & Operations Research (QROR)
Delhi	Statistics, Mathematics, Quantitative Economics, Quality, Reliability & Operations Research (QROR)
Bangalore	Mathematics, Quantitative Economics, Computer Science
Chennai	Statistics, Mathematics, Computer Science, Quality, Reliability & Operations Research (QROR)
Hyderabad	Quality, Reliability & Operations Research (QROR)

Eligibility

Statistics

(i) A good academic record with M Stat, MA/M Sc or equivalent degree in Statistics, or

(ii) outstanding mathematical maturity with B Stat/B Math, BA/B Sc or equivalent degree with Statistics as the main subject.

Mathematics

(i) A good academic record with M Stat, M Math, MA/M Sc or equivalent degree in Mathematics, or

(ii) outstanding mathematical maturity with B Stat/B Math, BA/B Sc or equivalent degree with Mathematics as the main subject.

Quantitative Economics

(i) A good academic record with MS (QE), M Stat, MA/M Sc or equivalent degree in Statistics/Mathematics/Economics/Econometrics/ Population Studies, or
(ii) outstanding mathematical maturity with BA/B Sc degree with Economics as the main subject. A candidate possessing a Master's degree in any subject with Mathematics/Statistics as a full subject at the undergraduate level.
(iii) a 4-year B Tech degree with sufficient coursework in Mathematics/Statistics.

Computer Science

(i) A good academic record with ME/M Tech or equivalent degree in Electronics/Telecommunication/Radio Physics/Computer Science/ Electrical Engineering/Microwave Communications/Information Technology/Bioinformatics/Biotechnology with Mathematics as a compulsory subject, or
(ii) a good academic record with M Sc/MCA/MA or equivalent degree in Physics/Mathematics/Applied Mathematics/Statistics/Electronic Sciences/Computer Science/Atmospheric Science/Information Technology/Bioinformatics/Biotechnology with Mathematics as a compulsory subject at the graduate level, or
(iii) a BE/B Tech or equivalent degree in the above subjects with outstanding results.

Quality, Reliability & Operations Research (QROR)

(i) A good academic record with M Tech/ME/MS/M Phil or equivalent degree in Quality/Reliability/Operations Research, or
(ii) a good academic record with M Stat/M Sc/MA or equivalent degree in Mathematics/Statistics/Physics with Mathematics as a compulsory subject at the graduate level, or
(iii) a BE/B Tech or equivalent degree in the above subjects with outstanding results.

Selection Procedure

Subject to the eligibility criteria being satisfied, the selection of candidates for this programme is strictly based on merit as judged by performance in selection tests and interview. Past academic record may also be taken into consideration.

Note: For an applicant with a Master's degree from ISI, who secured at least 70% in the aggregate without having taken a back-paper or compensatory examination in any course during the entire programme, the written test will be waived, and he/she will be called directly for interview by the corresponding JRF selection committee. However, such candidates are also

required to apply, like all other candidates, in the prescribed application form.

Note: Candidates who have been awarded a Junior Research Fellowship by NBHM/CSIR/UGC/ICMR/DST/DBT based on a nationally conducted written selection test, are also required to clear the JRF admission test or an equivalent separate test conducted by the relevant JRF selection committee of the institute.

Current Research Interests at Different Centres

Kolkata

***Statistics*:** Asymptotic Theory in Statistics, Decision Theory, Statistical Inference: parametric, non-parametric and semi-parametric, Bayesian Analysis, Model Selection, Resampling Plans, Sequential Analysis, Sequential Plan, Multivariate Analysis, Parametric/Non-parametric Regression Analysis, Robustness, Minimum Distance Methods, Discrete and Categorical Data Analysis, Linear Models, Parametric/Nonparametric Discriminant Analysis, Biostatistics, Environmental Data Analysis, Survival 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, Small Area Estimation, 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, Statistical Pattern Recognition, Image Analysis, HIV/AIDS Modelling. Clinical Trial, Majorisation, Brain Mapping.

***Mathematics*:** Functional Analysis, Geometry of Banach Spaces, Algebraic and Differential Topology, Symplectic Topology, Transformation Groups, Harmonic Analysis, Commutative Algebra and Affine Algebraic Geometry: Projective Modules and Euler Class Groups, Affine Fibrations, Locally Nilpotent Derivatives and allied areas, Combinatorics, Graph Theory, Mathematical Logic, Set Theory and Descriptive Set Theory, Spectral Theory of Differential Operators, Noncommutative Geometry, Cryptology, Stochastic Processes, Probability Inequality, Large Deviations, Stochastic Calculus, Financial Mathematics, Markov Chains, Diffusion, Limit Theorems, Stochastic Approximations, Random Matrices, Extreme Value Theory, Heavy Tails and Long Range Dependence.

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

Econometrics, Empirical/Applied Econometrics, Poverty and Inequality, Polarisation, Statistical Analysis related to the Indian Economic, Financial and Demographic Scenario.

***Computer Science*:** Computer Networks–Ad-hoc, Wireless Sensor, Wireless Mesh, UMTS Network Design; Parallel and Distributed Computing, Mobile Computing, Cluster Computing, Parallel/Distributed Architectures and Algorithms; Nanotechnology and Gigascale Integration, Electronic Design Automation Algorithms and Testing, Biochips and Nano-biosystems, Intellectual Property Protection of SoCs, Quantum Computing, Fault Tolerance; Computational Geometry, Graph Theory, Combinatorial Optimisation, Algorithms and Computational Complexity; Computational Molecular and Systems Biology, Bioinformatics; Pattern Recognition, Machine Learning, Artificial Intelligence, Web Intelligence and Web Mining, Text Mining, Data Mining, Information Retrieval, Natural Language Processing, Computational Linguistics; Computer Vision, Digital Document Processing, Image and Video Processing, Content-based Image Retrieval, Computer Graphics, Biomedical Image Processing, Video Surveillance; Speech and Signal Processing; Artificial Neural Nets, Case Based Reasoning, Evolutionary Computing, Fuzzy Sets and Systems, Fuzzy Control, Granular Computing, Rough Sets, Swarm Intelligence, DNA-Computing; Mathematical Morphology, Fractals, Wavelets; Artificial Immune System, Neurodynamics; Digital Watermarking; Atmospheric Science, Remote Sensing; Theory and Applications of Cellular Automata; Cryptology, Coding Theory, Information Theory, Perception Engineering, Computational Neuroscience.

Quality, Reliability & Operations Research (QROR): Business Analytics and Data Mining, Six Sigma and Lean Six Sigma, Mathematical Programming, Reliability Models, Process Control, Process Optimisation.

Delhi

***Mathematics*:** Algebraic groups over arbitrary fields. Algebras with involutions. Galois cohomology. Non-associative algebras and exceptional algebraic groups. Quadratic forms. Quantum groups, non-commutative geometry, operator algebras, KK-theory. Analysis and geometry of matrices and linear operators. Generalised inverse of a matrix. Matrices and graphs. Number theory, Diophantine equations, irreducibility of polynomials, prime numbers. Cryptography. Combinatorial optimisation problems. Extreme value theory. Interacting particle systems. Markov chains. Markov processes and martingale problems. Percolation theory. Random graphs, probability on trees. Random walks in random environments. Stochastic differential equations. Stochastic filtering theory. Stochastic control. Urn models.

***Statistics*:** Computational biology. High-dimensional data. Penalised regression. Resampling methods. Reliability. Non-linear regression. Non-

parametric inference. Statistical computing. Statistical graphics. Statistical signal processing. Surrogate data. Survival analysis.

***Quantitative Economics*:** Optimisation Theory, Game Theory and Applications, Mechanism Design, Auction Theory, Choice Theory, Industrial Organisation, International Trade and Finance, Macroeconomic Theory, Growth Theory and Empirics, Applied Econometrics, Political Economy, Empirical and Theoretical Development Economics, Economics of Education, Health Economics, Agricultural Economics, Environmental and Natural Resource Economics, Experimental Economics, Economics of Terrorism and Conflict.

***Quality, Reliability & Operations Research (QROR)*:** Complementarity Problems, Game Theory, Design of Experiments.

Bangalore

***Mathematics*:** Algebraic Geometry, Algebraic Groups, Coding Theory, Ring theory, Operands, Finite Geometry, Finite Groups, Buildings, Number Theory, Topology, Combinatorial Topology, Complex geometry, Differential geometry. Probability Theory, Stochastic Processes, Diffusion Processes, Reflected Diffusion, Martingale problems, Interacting particle systems, Probability measures on groups. Functional Analysis, Geometry of Banach spaces, Operator Theory, Operator Algebras, Quantum Probability, Hilbert Modules.

***Computer Science*:** Mathematical Morphology, Digital Geometry, Earth Systems Science, Spatial Informatics, Theoretical GISci and Geocomputation, Satellite Remote Sensing Data Analysis, Digital Image Processing, Digital Geographics, Modeling the behavior Complex Terrestrial Systems via Chaos and Bifurcation Theories, Fractals and Multifractals, Computational Neuroscience (Brain Signal Modeling), Brain Functions Modeling, Human EEG Processing, Small Networks Modeling, Information Granulation, Granular Computing, Pattern Recognition, Machine Learning, Image and Video Processing, Soft Intelligence Computing, Computational Intelligence.

Quantitative Economics: Development economics, Agricultural economics.

Hyderabad

***Quality, Reliability & Operations Research (QROR)**:* Operations Research and Mathematical Modeling.

Chennai

Statistics: Quantitative Finance, Reliability, Survival Analysis.

Mathematics: Complex analysis, Mathematical Logic, Game theory.

Quality, Reliability & Operations Research (QROR): Semidefinite Linear Complementarity Problems, Stochastic Games, Optimisation, Cooperative games, Reliability and Operations Research.

Computer Science: Theoretical Computer Science, Cryptography.

II. Junior/Senior Research Fellowships in Other Subjects

Scope

The Institute also offers Junior/Senior Research Fellowships in several areas of the Natural Sciences and the Social Sciences. However, candidates working for Ph D in any area other than the five mentioned in (I) above, need to register with other Universities/Institutes for their Ph D degree. A student is initially admitted as a Junior Research Fellow. After two years of satisfactory progress, Junior Research Fellows are assessed for the award of Senior Research Fellowships. The combined duration of the Junior and Senior Research Fellowships is **six** years. The areas in which the Institute wants to recruit JRFs this year and the respective eligibility conditions for applying for admission are as follows.

(a) Physics and Applied Mathematics: Quantum Mechanics, Condensed Matter Theory, High Energy Physics, Quantum Field Theory, Cosmology and Astrophysics, Bio and Computational Fluid Dynamics, High Performance Computing and Image Analysis, Nonlinear Dynamics.

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

(b) Agriculture and Ecology: Crop-weather relationships

Eligibility: A good academic record with M Sc in Agriculture with specialisation in Agronomy.

(c) Sociology: Agricultural and Rural Development, Development Studies, Labour Studies, Gender studies.

Eligibility: A good academic record with MA/M Sc or M Phil or equivalent degree in Development Studies/Sociology/Economics/Agricultural Economics.

(d) Geology: Sedimentology, Geomorphology, Quaternary Geology, Vertebrate Paleontology, Structural Geology.

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

(e) Library and Information Science

Eligibility: A consistently good academic record with first or high second class in MS (LIS) awarded by ISI or Associateship in Documentation and Information Science of ISI or NISCAIR/INSDOC or its equivalent degree (such

as Master's degree in Library and Information Science from any University) with at least 55% marks in the undergraduate programme.

(f) Psychology: Cognitive Psychology, Organisational Psychology, Educational Psychology, Personality and Developmental Psychology, Rural Psychology and Mental Health.

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

(g) Linguistics: Corpus Linguistics, Computational Linguistics, Applied Linguistics, Cognitive Linguistics, Translation Studies.

Eligibility: A consistently good academic record with a Bachelor's Degree in Linguistics/English as the Honours/full subject and First Class or high Second Class in Master's Degree in Linguistics (with specialisation in Applied Linguistics/Language Teaching/Lexicography/Field Linguistics/ Computational Linguistics/Translation Studies/Discourse Study)**.**

Centres

The names of the centres along with the respective subjects in which research fellowships in other subjects are being offered this year are given below.

Centre	Subject
Kolkata	Physics and Applied Mathematics, Agriculture and Ecology, Sociology, Geology, Psychology, Linguistics
Bangalore	Library and Information Science

Selection Procedure

Subject to satisfying the eligibility criteria, the selection of candidates for JRF is strictly based on merit as judged by their performance in selection tests and interviews. Past academic record may also be taken into consideration.

Note: Candidates who have been awarded a Junior Research Fellowship by NBHM/CSIR/UGC/ICMR/DST/DBT based on a nationally conducted written selection test, are also required to clear the JRF admission test or an equivalent separate test conducted by the relevant JRF selection committee of the institute.

- **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, Computer Science, and Quality,

Reliability & Operations Research (QROR). For this purpose, it is necessary for any 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 conditions for registration as a candidate for the Ph D degree of Indian Statistical Institute are available on the webpage http://www.isical.ac.in/~deanweb/phdrules.html.

All correspondence regarding registration and other matters connected with Ph D degrees may be addressed to the Convener of the Ph D–D Sc Committee of the concerned discipline at the address: **Indian Statistical Institute, 203 B T Road, Kolkata 700 108**.

6. Other Information for Prospective Students

- **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.

- **Stipends, Fellowships and Allowances**

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

Research Fellows with ME/M Tech or equivalent will be entitled to ₹ 18000/- per month as JRF, and ₹20000/- per month as SRF.

A Special Research Fellowship of ₹ 20000 per month (JRF-level)/ ₹ 24000 per month (SRF-level) may be awarded to outstanding candidates in each of the following subjects: (i) Statistics, (ii) Mathematics, (iii) Computer Science, (iv) Quantitative Economics, and (v) Quality, Reliability & Operations Research.

PROGRAMME	Stipend/Fellowship Per month (₹	Contingency/book grant per year (₹
B Stat (Hons)/ B Math (Hons)	3000	3000
M Stat/M Math/ MS(QE)/MS (LIS)	5000	5000
M Tech (CS)/ M Tech (QROR)	8000	5000
Post-Graduate Diploma in Statistical Methods with Applications	2000	2000
Junior Research Fellowship (JRF)	16000/18000‡ + HRA as per rules	20000
Senior Research Fellowship (SRF)§	18000/20000 + HRA as per rules	20000
Special Research Fellowship	20000/24000 + HRA as per rules	70000

- **Discipline**

Every student of the Institute is expected to observe the normal discipline of the Institute and shall not indulge in cheating in the examinations, unruly behavior 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 the **Students' Brochure**. Violations of these are likely to attract punishments such as withdrawal of stipend, withholding of promotion/award of degree, and/or expulsion from the hostel/Institute.

Ragging is banned in the Institute. If any incident of ragging comes to the notice of the authorities, the concerned student shall be given liberty to explain, and if his/her explanation is not found to be satisfactory, he/she may be expelled from the institute. The punishment may also take the shape of

(i) suspension from the Institute for a limited period,
(ii) suspension from the classes for a limited period,
(iii) withholding stipend/fellowship or other benefits,
(iv) withholding results,
(v) suspension or expulsion from hostel and the likes.

Local laws governing ragging are also applicable to the students of the Institute.

‡ For research fellows with ME/M Tech or equivalent.

§ after two years as JRF

- **Hostel**

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

- **Placement of Students**

Students who have undergone the B Stat (Hons), B Math (Hons), M Stat, M Math, MS (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 examinations.

There is a Placement Committee in Kolkata, which arranges campus interviews by prospective employers. Campus interviews are also organised at the Delhi and Bangalore Centres.

- **Examination, Rules for Passing and Promotion**

Examinations

There are two examinations in each course in all programmes: *mid-semestral* and *semestral* (final). The composite score in a course is a weighted average of the scores in the mid-semestral and semestral examinations, home-assignments, practical record-book, project work, etc. (announced at the beginning of the semester).

The minimum composite score required for passing a course (including a non-credit course) is 35%, except for the core courses (Project-I, Project-II, Dissertation, OR-I, SQC-I and Reliability-I) in M Tech (QROR), for which it is 45%.

If the composite score of a student falls short of 45% in a credit course, or 35% in a non-credit course the student may take a back-paper examination to improve the score. A student must take a back-paper examination if the composite score is less than the minimum pass marks. At most one back-paper examination is allowed in a particular course. The maximum score a student can secure in a back-paper examination is 45%. The maximum number of back-papers that can be taken in any given year of a programme is specified in the Students' Brochure.

If a student misses any mid-semestral, semestral and back-paper examination due to medical or family emergencies, there is a provision for *supplementary* examination. The student can score at most 60% in the supplementary examinations to mid-semestral and semestral examinations, and at most 45% in the case of a back-paper examination.

Further, there is scope for a *compensatory* examination, details of which are available in the Students' Brochure.

Promotion

Details of rules for promotion from one year to the next year of an academic programme are given in the Students' Brochure.

A student who fails to meet the passing criteria in any given year of a programme is permitted to repeat the year, subject to a maximum of two repeat years (any one of the first two years and the final year) for the undergraduate programmes and one for all others. **The final score in a year being repeated is the maximum of the scores obtained in the two years.**

Final Result

If a student has passed in all the semesters and his/her conduct has been found to be satisfactory, he/she is awarded the degree in the *First Division with distinction* or *First Division,* or *Second Division* or *Pass* (in some programmes), depending upon criteria specified in the Students' Brochure.

7. Brief Description of Academic Programmes

For all the regular degree courses, each 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/August and ends in November/December. The second semester (Semester II) starts in January and, for all the courses other than the two M Tech courses, usually ends in May. For the two M Tech course, Semester II usually ends in July, after summer training for M Tech (CS) and after field training for M Tech (QROR). Classes are held on weekdays (Monday to Friday) during 9:30/ 10 am to 6 pm 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, selection procedure, etc. as and when needed. The M Stat, M Math and MS (QE) courses are presently under review and the new syllabus may be implemented in the next academic year.

- **Bachelor of Statistics (Honours) [B Stat (Hons)]**

This three-year programme consists of a total of thirty courses distributed as five courses per semester. In addition, students who are found to lack adequate proficiency in English 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 and Matrices I, Introduction to Programming and Data Structures, Remedial English (non-credit).*

Semester II: *Statistical Methods II, Probability Theory II, Analysis II, Vectors & Matrices II, Numerical Analysis.*

Second Year

Semester I: *Statistical Methods III, Probability Theory III, Analysis III, Elements of Algebraic Structures, Elective Course I.*

Semester II: *Introduction to Markov Chains*, *Statistical Methods IV, Discrete Mathematics, Economic and Official Statistics and Demography, Elective Course II.*

Third Year

Semester I: *Linear Statistical Models, Parametric Inference I, Sample Surveys, Statistical Quality Control and Operations Research, Elective Course III.*

Semester II: *Nonparametric and Sequential Methods, Design of Experiments, Statistics Comprehensive, Design and Analysis of Algorithms, Optional course.*

List of Elective Courses: *Microeconomics, Macroeconomics, Geology, Agricultural Science, Psychology, Introduction to Sociology, Introduction to Anthropology, Physics I, Physics II, Physics I.*

List of Optional Courses: *Resampling techniques, Statistical Methods in Genetics, Random Graphs, Percolation Theory, Differential Equations, Number Theory, Special Topics in Algorithms.*

- **Bachelor of Mathematics (Honours) [B Math (Hons)]**

This 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, Computer Science I, Writing of Mathematics (non-credit).*

Semester II: *Analysis II, Algebra II, Probability Theory II, Physics I.*

Second Year

Semester I: *Analysis III, Algebra III, Statistics I, Physics II, Optimisation.*

Semester II: *Graph Theory, Algebra IV, Statistics II, Topology, Computer Science II.*

Third Year

Semester I: *Complex Analysis, Introduction to Differential Geometry, Physics III, Statistics III, Elective Subject I.*

Semester II: *Analysis IV, Introduction to Differential Equations, 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, Introduction to Algebraic Geometry, Introduction to Algebraic Number Theory, Differential Geometry II, Introduction to Differential Topology, Mathematics of Computation, Introduction to Dynamical Systems, Introduction to Representation Theory, Topics in Optimisation, Combinatorics, Topics in Applied Stochastic Processes, Introduction to Stochastic Processes, Stochastic Models in Insurance, Mathematical Morphology and Applications, Elements of Statistical Computing.*

- **Master of Statistics [M Stat]**

The M Stat programme is offered in two different streams, namely, *B-stream* and *NB-stream*. Further, the students of this programme need to do either a two-year *Applications* specialisation[**] or one of the following specialisations in the second year:

Advanced Probability (AP)
Actuarial Statistics (AS)
Applied Statistics and Data Analysis (ASDA)
Biostatistics and Data Analysis (BSDA)
Industrial Statistics and Operations Research (ISOR)
Mathematical Statistics and Probability (MSP)
Quantitative Economics (QE)

A student with a B Stat (Hons) degree from the Institute is put in the B-stream and he/she has to choose between the usual first year curricula for the B-stream and the *Applications* specialisation. A student, who joins M Stat through the admission test, is placed in NB-stream *or* B-stream with usual respective first year curricula *or Applications* specialisation by the Selection Committee.

After the first year, students who opted for the *Applications* specialisation may continue the specialisation, or opt for a different specialisation mentioned above. Those opting for a different specialisation will have to take the following courses concurrently in the second year:

(i) a non-credit course in C/C++ programming and
(ii) the courses prerequisite for the chosen specialisation.

Students, who did not do *Applications* specialisation in the first year, can also opt for any specialisation including *Applications* in the second year.

Offering of a given specialisation at a particular centre is subject to the interest of the students and the availability of requisite resources. The Dean of Studies will inform the students in advance about the availability of the specialisations and the respective centres. **Not all specialisations may be offered at all the centres**.

[**] The *Applications* specialisation is not being offered in the academic year 2013-14.

The first year programme for the B-stream will be held at Kolkata, while for the NB-stream, it will be held at Chennai and Delhi.

In case a particular specialisation is not offered at a centre, a student of that centre opting for that specialisation may be asked to study at a centre where such specialisation is offered. Each specialisation has a number of prerequisites in terms of specific courses. The selection of students for various specialisations in the second year will depend on students' preferences, their academic background as well as their performance in the First Year. The final selection of students for various specialisations in the second year is determined by the Dean of Studies in consultation with the Teachers' Committee.

First Year

The curriculum for the First Year consists of ten courses for each of B-stream, NB-stream, and Applications Specialisation, 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.*

***NB*-stream:**

Semester I: *Linear Models & Markov Chain, Real Analysis, Large Sample Statistical Methods, Sample Surveys & Design of Experiments, Statistical Inference I.*

Semester II: *Regression Techniques, Multivariate Analysis, Programming & Data Structures, Elective I, Elective II.*

Elective Courses: *Time Series Analysis, Discrete Mathematics, Optimisation Techniques, Measure Theoretic Probability, Metric Topology & Complex Analysis, Nonparametric and Sequential Analysis (the last three are available only to NB-Stream students).*

Applications Specialisation

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.*

Second 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

specialisation and a certain number (as required by the specialisation) of courses from the Lists of Elective Courses (details of which are available in the Students' Brochure for M Stat) for his/her specialisation. The remaining elective courses, if any, can be selected from any other course offered in the second year of the M Stat programme at that centre.

The compulsory courses for the **Applications Specialisation** in the second year are as follows.

Semester I: *Analysis II, Statistical Computing, Time Series Analysis.*

Semester II: *Probability and Stochastic Processes III, Project.*

The compulsory courses for all other specialisations offered in the second year are listed below.

(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) **Biostatistics & 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 Optimisation, Industrial Applications of Stochastic Processes, Optimisation 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.*

- **Master of Mathematics [M Math]**

This programme is conducted over four semesters. A student will have to take five courses in each semester.

Compulsory Courses: *Analysis of Several Variables, Measure Theoretic Probability, Algebra I, Topology I, Linear Algebra, Complex Analysis, Functional Analysis, Algebra II, Topology II, Differential Geometry I, Differential Topology, Fourier Analysis, and Basic Probability Theory (only for non-B Stat and non-B Math students).*

Elective Courses: *Differential Equations (only for non-B Stat and non-B Math students), Graph Theory and Combinatorics, Number Theory, Commutative Algebra I, Differential Geometry II, Topology III, Partial Differential Equations, Advanced Probability, Algebra III, Representations of Locally Compact Groups, Commutative Algebra II, Advanced Number Theory, Algebraic Geometry,*

Algebraic Number Theory, Markov Chains, Ergodic Theory, Topology IV, Advanced Functional Analysis, Operator Theory, Set Theory, Mathematical Logic, Advanced Linear Algebra, Lie Groups and Lie Algebras, Linear Algebraic Groups, Elliptic Curves, Stochastic Processes, Game Theory, Automata Languages and Computation, Advanced Fluid Dynamics, Quantum Mechanics I, Quantum Mechanics II, Analytical Mechanics, Project I, Project II and Special Topics.

Offering an elective course will depend on students' interest and availability of teachers. Each student **has to take at least one of the following three courses**: *Number Theory, Advanced Number Theory, Algebraic Number Theory*. 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.

- **Master of Science in Quantitative Economics [MS (QE)]**

This two-year programme consists of 8 compulsory courses and 12 elective courses, distributed over four semesters. The compulsory courses 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 Organisation, 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 Organisations, Privatisation 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.

- **Master of Science in Library and Information Science [MS (LIS)]**

This two-year programme consists of a total of twenty credit-courses distributed over four semesters. These include colloquium, seminar and dissertation work. In addition, there are two courses in Elementary Mathematics (each carrying four credits) in the first and second semesters. However, for those who have not studied Mathematics at the plus two level, these two courses are credit-courses.

The dissertation work on an approved topic will be spread over the 3rd and 4th semesters. Evaluation of dissertation will be based on (a) the contribution by the student (original contribution or some developmental work), (b) report itself, (c) presentation in an open seminar (defense), and (d) depth of knowledge in the area.

The courses along with their sequencing over the semesters are as follows:

Semester I: *Foundations of Library and Information Science; Information Organisation (Theory and Practice); Cataloging and Metadata (Theory and Practice); Foundations of Computer & Information Technology; Library Management & Library Automation (4 credits each) and Elements of Mathematics-I (credit or non-credit).*

Semester II: *Information Sources, Systems and Services; Elements of Statistics and Research Methodology; Digital Libraries; Data Structures and Programming; Colloquium (4 credits each) and Elements of Mathematics-II (credit or non-credit).*

Semester III: *Information Storage, Retrieval and DBMS; Content Management Systems (CMS); Informetrics and Scientometrics; Web Technologies and Web-based Information Services; Seminar (4 credits each) and Dissertation.*

Semester IV: *Networking Technologies and Library Networks; Knowledge Management Systems; Semantic Web; Elective (4 credits each) and Dissertation (8 credits).*

Electives (any one of the following): *Business & Corporate Information Systems; Health Information Systems; Agricultural Information Systems, Social Science Information Systems; TQM; Data & Text Mining.*

The programme may also include any other advanced level course as recommended by the Teachers' Committee and approved by the Academic Council.

- **Master of Technology in Computer Science [M Tech (CS)]**

This two-year programme is divided into four semesters. A student is required to take five courses each in the first three semesters, and two courses in the fourth semester. Apart from these seventeen courses, a student has to undergo dissertation work during the third and fourth semesters of the course. 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

organisation under the guidance of an assigned supervisor in that institute/organisation.

Further, a student may take extra noncredit courses, at most one per semester, either on recommendation of the faculty or out of his/her own interest.

The courses of study in various semesters are as follows.

First Year

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

List A: *Introduction to Programming, Data and File Structures Laboratory, Computer Organisation, Elements of Algebraic Structures, Probability and Stochastic Processes, Principles of Programming Languages.*

Semester II: *Computer Networks, Design and Analysis of Algorithms, Automata Languages and Computation, Database Management Systems, Operating Systems.*

Second Year

Semester III: *Five electives to be selected from the List B of courses, as advised by the faculty based on the background of the student and Dissertation (to be continued through the fourth semester).*

Semester IV: *Two electives to be selected from the List B of courses given below and Dissertation (continued from the third semester).*

List B: *Computer Architecture, Compiler Construction, Software Engineering,* Cryptology, *Information and Coding Theory, Advanced Cryptology, Information Security and Assurance, Topics in Algebraic Computation, Optimisation Techniques, Advanced Algorithms for Graph and Combinatorial Optimisation Problems, Multi-dimensional Search and Computational Geometry, Combinatorial Geometry, Topics in Algorithms and Complexity, Computational Complexity, Quantum Information Processing and Quantum Computation, Computational Finance, Algorithmic Game Theory, Computational Molecular Biology and Bioinformatics, Parallel Processing: Architectures and Algorithms, Formal Aspects of Programming Languages and Methodology, Logic for Computer Science, Formal Methods in Computer Science - Selected topics, Logic Programming and Deductive Databases, Lambda-Calculus, Combinators and Functional Programming, Advanced Operating Systems, Advanced Database Theory and Applications, Real Time Systems, Robotics, Distributed Computing Systems, Mobile Computing, Software Design and Validation, VLSI Design and Algorithms, Nanotechnology and Biochips, VLSI Testing and Fault-tolerance, Internet and Multimedia Technologies, Digital Signal Processing, Pattern Recognition and Image Processing, Artificial Intelligence and Expert Systems, Advanced Web Technology/ Advanced Internet Programming, Advanced Pattern Recognition, Advanced Image Processing, Computer Vision, Computer Graphics, Data Mining, Analysis of Remote Sensing Images, Fuzzy Logic and*

Applications, Neural Networks and Applications, Document Processing and Retrieval, Selected Topics on recent developments 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 toward 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 relate to a relevant problem in an area of Computer Science and/or its applications, and 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 may also be acceptable as a dissertation.

The work should commence 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 faculty members, 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 three credit courses.

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

This two-year programme is divided into two semesters each per year. 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 selected from a broad range of subjects like *Applied Stochastic Processes, Advanced Statistical Methods, Advanced Optimisation Techniques, Software Engineering, Database Management Systems, Advanced Reliability, Game Theory and Decision Theory*, or other selected subjects as suggested by the faculty.

The Teachers' Committee will decide on the elective 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, the students have to undertake project studies (Project - I) in industries. During the fourth semester of the second year, they have to work on dissertation at the Institute and also have to undertake the second phase of project work (Project – II) in industries.

- **Postgraduate Diploma in Statistical Methods with Applications**[††]

This one-year programme consists of a total of 10 courses distributed as five courses in each of the two semesters. While all the 5 courses in the first semester are compulsory, only 2 are so in the second semester. The remaining three *viz.*, *Special Topics I, Special Topics II, and Special Topics III* are module-based courses—each comprising 3 modules—to be chosen/offered out of a total of 17 modules on special topics. Each of these modules would be taught over a period of one month involving about 20 lecture hours.

Semester I: *Real Analysis, Linear Algebra, Probability, Descriptive Statistics, Numerical Analysis and Programming in C.*
Semester II: *Bivariate and Multivariate Analysis, Statistical Inference, Special Topics I [3 out of 17 modules to be offered], Special Topics II [3 out of the remaining 14 modules to be offered], Special Topics III [3 out of the last remaining 11 modules to be offered].*
Special topic modules: *(1) Time Series Analysis, (2) Econometrics, (3) Survival Analysis, (4) Clinical Trials, (5) Life Testing & Reliability, (6) Actuarial Methods, (7) Statistical Quality Control, (8) Operations Research, (9) Demography, (10) Sample Surveys, (11) Linear Models, (12) Design of Experiments, (13) Introduction to Stochastic Processes, (14) Statistical Computing, (15) Data Structures and Basic Algorithms, (16) Introduction to DBMS, (17) Topics of Current Interests*

All students are required to spend one week at the headquarters of the institute (Kolkata) at the end of Semester I. During this period, they are expected to visit different units of the institute and also the National Sample Survey Office (NSSO), Kolkata.

8. Other Courses Offered at ISI

- **Part-time Course in Statistical Quality Control**[‡‡]

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

[††] This programme will be notified separately, if offered in 2013-14.
[‡‡] This course will be notified separately.

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 at Bangalore and Hyderabad. However, it is not offered at a centre in a session unless at least 10 selected candidates are enrolled for it.

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 duration each commencing at 1800 hours or at the week-ends with four hour sessions each day on Saturday and Sunday.

Eligibility

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

(i) Diploma in any branch of Engineering or Technology from a recognised Institution;

(ii) Bachelor's degree (with Mathematics at the pre-university or equivalent level) from a recognised 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 organisation. The sponsoring organisations 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 for the project guide—to travel from the SQC and OR Unit to the organisation and back for supervising the project work.

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 organisation.

A fee of ₹ 1500/- is charged. The course is now under review.

- **Specialist Development Programme (SDP) in Statistical Quality Control and Operations Research[§§]**

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

[§§] This course will be notified separately, if offered in 2013-14.

development. The programme is offered at the SQC & OR Units of the Institute in Bangalore, Baroda, Mumbai, Kolkata, Coimbatore, Delhi, Hyderabad, Chennai and Pune.

Duration

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

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 ISI or at least one year's specialised 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 ISI may be directly admitted to the second year of the SDP.

Selection Procedure

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

Programme Structure

The participants are given specific field assignments involving consultation, training, applied research etc. including responsibilities for independent projects involving organisation 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.

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.

The **Head, SQC and OR Unit, Indian Statistical Institute, 203 B T Road, Kolkata 700 108,** should be contacted for further details on the programme.

• Other Courses Conducted by the Institute

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

Courses of the International Statistical Education Centre (ISEC)

The International Statistical Education Centre (ISEC) is operated by 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 organised 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 mainly to Government-sponsored candidates. 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**. The information is also available at *http://www.isical.ac.in/~isec*.

Central Statistical Organisation (CSO) Courses

These courses are organised by the Central Statistical Organisation (CSO) of the Government of India, jointly with Indian Statistical Institute, and are designed to equip statistical officers and probationers of the Indian Statistical Service (ISS) with advanced statistical 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 Organisation, Jeevan Prakash Building, 25 Kasturba Gandhi Marg, New Delhi 110 001.**

	Programme	Duration	Venue
ISEC Courses	Statistical Training Diploma (Regular Courses)	10 months	Kolkata
	Special courses	1 to 12 months	Kolkata
CSO courses	ISS Probationers' Course in Statistical Methodology	10 weeks	Kolkata and/or Delhi

9. Application Procedure

Application to the programmes being offered by Indian Statistical Institute in the academic year 2013-14, can be made in any one of the three following ways:

(i) The application form, along with the prospectus, can be purchased against payment of the application fee (see next page) in cash from the following centres of the Institute (from 11 am to 2 pm on all working days from Monday to Friday):

1) Indian Statistical Institute, 203 B. T. Road, Kolkata 700 108.
2) Indian Statistical Institute, Delhi Centre, 7, S.J.S. Sansanwal Marg, Near Qutab Hotel, Opposite Katwaria Sarai, New Delhi 110 016.
3) Indian Statistical Institute, Bangalore Centre, 8th Mile, Mysore Road, R. V. College P.O., Bangalore 560 059.
4) Indian Statistical Institute, SQC & OR Unit, 110 Nelson Manickam Road (1st floor), Aminjikarai, Chennai 600 029.
5) Indian Statistical Institute, SQC & OR Unit, Street No. 8, Habshiguda, Hyderabad 500 007.

The completed form (instructions for filling it are given on page 41) may then be sent to the address given below, so as to reach not later than **06 March 2013.**

The Dean of Studies
Admissions 2013
Indian Statistical Institute
203 B. T. Road
Kolkata 700 108.

(ii) The form can also be downloaded from the Institute website ***http://www.isical.ac.in.*** The completed form may be sent to the address given above, along with a bank draft for the application fee (see next page), drawn in favour of *Indian Statistical Institute*, payable at Kolkata, so as to reach not later than **06 March 2013.**

(iii) Application can also be made online through the Institute website ***http://www.isical.ac.in***. For online application, a student must have access to the Internet, digital images of his photograph and his signature, an email account, Acrobat reader, and a printer to take printout of the admit card.

Digital images of the photograph and the signature of the applicant must be in any of the formats *bmp/gif/png/jpg/jpeg*, with sizes as specified below:

1. Applicant's Photo: 600 pixels (width) × 600 pixels (height), maximum permissible image size being 50KB,
2. Applicant's Signature: 800 pixels (width) × 300 pixels (height), maximum permissible image size being 30KB.

The applicant must initially create a login account at ISI website for this purpose, followed by the filling up of the form and upload of the photograph and signature. A challan will be generated with the student's particulars, the fee amount and other relevant information filled in automatically. The applicant will need to take it to any branch of the **State Bank of India** with the printed fee amount, fill in the branch name and code, and sign in the designated places on the challan. The bank will accept the cash, put in the journal number and the seal and the signature of the bank and return the

applicant's copy. This copy must be retained by him/her. The student should login again into his account, and fill in the journal number to complete the application.

Once the admit card is generated, those who have applied online, will be notified by e-mail about this, and they will be required to take a printout of the admit card to bring to the exam centres. Other students will get their admit cards by post.

Application Fee

- ₹ **500.00** for all applicants
  - in the general category
  - all applicants for the JRF programmes (irrespective of reservation category)
- ₹ **250.00** for applicants for all programmes (excluding the JRF programmes) belonging to reserved categories

Mode of Payment

- **CASH**: For purchase of application forms from ISI Offices (from 11 a.m. to 2 p.m. on all working days from Monday to Friday).
- **BANK DRAFT**: For downloaded form, to be drawn in favour of "**Indian Statistical Institute**" payable at Kolkata and to be attached to the filled-in form.
- **CASH DEPOSIT TO BANK**: For online application, the challan generated must be taken to any branch of **State Bank of India** with the branch name and code filled in, and the applicant's signature. The bank will accept in cash the application fee amount printed therein, put in the journal number and the seal and the signature of the bank and return the student's copy (see item 9 (iii) above).

Note: Postal orders, Money orders and Cheques will not be accepted.

- **Instructions for filling in the application form**

Applicants are advised to study the prospectus carefully and satisfy themselves that they are eligible for admission to the course/fellowship for which they are applying. 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 examinations 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 applications will be cancelled if the final examinations are not completed before **01 July 2013**. 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 had failed in a programme of the Institute and had been asked to discontinue the programme, he/she is not eligible for readmission to the same programme.**

The application form should be filled in carefully and legibly. Instructions given below should be strictly followed. A sample application form is given at the end of this booklet for reference.

- The space marked **For Office Use** must be left blank.
- 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.

CODE	PROGRAMME
BSTK	B Stat (Hons) (Kolkata)
BMTB	B Math (Hons) (Bangalore)
MSTD	M Stat (Delhi)
MSTC	M Stat (Chennai)
MMTB	M Math (Bangalore)
MQEK	MS in Quantitative Economics (Kolkata)
MQED	MS in Quantitative Economics (Delhi)
MLIB	MS in Library and Information Science (Bangalore)
MCSK	M Tech in Computer Science (Kolkata)
MQRK	M Tech in Quality, Reliability and Operations Research (Kolkata)
JSTK	JRF in Statistics (Kolkata)
JSTD	JRF in Statistics (Delhi)
JSTB	JRF in Statistics (Bangalore)
JSTC	JRF in Statistics (Chennai)
JMTK	JRF in Mathematics (Kolkata)
JMTD	JRF in Mathematics (Delhi)
JMTB	JRF in Mathematics (Bangalore)
JMTC	JRF in Mathematics (Chennai)
JQEK	JRF in Quantitative Economics (Kolkata)
JQED	JRF in Quantitative Economics (Delhi)
JQEB	JRF in Quantitative Economics (Bangalore)
JCSK	JRF in Computer Science (Kolkata)
JCSB	JRF in Computer Science (Bangalore)
JCSC	JRF in Computer Science (Chennai)
JQRK	JRF in Quality, Reliability and Operations Research (Kolkata)
JQRD	JRF in Quality, Reliability and Operations Research (Delhi)
JQRC	JRF in Quality, Reliability and Operations Research (Chennai)
JQRH	JRF in Quality, Reliability and Operations Research (Hyderabad)
JLIB	JRF in Library and Information Science (Bangalore)
JPMK	JRF in Physics and Applied Mathematics (Kolkata)
JAEK	JRF in Agriculture and Ecology (Kolkata)
JSOK	JRF in Sociology (Kolkata)
JGEK	JRF in Geology (Kolkata)
JPSK	JRF in Psychology (Kolkata)
JLNK	JRF in Linguistics (Kolkata)

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

- The following relate to specific items in the application form :
  i. ***Items 1 and 2.*** One box should be left blank between words. The address to which you want correspondence to be sent is to be written here in CAPITAL LETTERS along with telephone number, mobile number and e-mail address, if any.
  ii. ***Items 6 and 7.*** Relevant documents (see Section 4 (page 8) of this prospectus for details) must be produced at the **time of interview**, failing which the candidates will not be considered for admission.
  iii. ***Item* 8.** Choose the programme you want to apply for and write the corresponding code (see the table on the previous page) in the boxes provided. **Selection tests for all programmes will be held on the same day**. In view of this, candidates are advised to apply to **only one programme** for the academic year **2013-2014**. The option of giving a second preference is available only to applicants to the B Stat (Hons) and B Math (Hons) programmes (see page 10).
  iv. ***Item* 9.** Admission tests will be conducted at the centres given in the following table. Candidates should name three centres in decreasing order of their preference and write the corresponding codes (see the table below) in the boxes provided.

Code	Centre	Code	Centre	Cod	Centre
AG	Agartala	GH	Guwahati	PT	Patna
BG	Bangalore	HY	Hyderabad	PU	Pune
BP	Bhopal	JP	Jaipur	RN	Ranchi
BH	Bhubaneswar	KH	Kharagpur	SL	Shillong
BD	Burdwan	CC	Kolkata	SG	Siliguri
CH	Chandigarh	LU	Lucknow	SR	Srinagar
CN	Chennai	ML	Malda	ST	Surat
CO	Cochin	MN	Mangalore	TZ	Tezpur
DH	Delhi	MB	Mumbai	VN	Varanasi
GT	Guntur	NG	Nagpur	VP	Visakhapatnam

  v. ***Item* 10 (a).** INMO AWARDEES applying for B Stat (Hons)/B Math (Hons) must mention the year of selection for IMOTC in the space provided. (*see page 9*)
  vi. ***Item* 10 (b).** Those applying for M Tech (CS), who have a valid **GATE** score, must write all the required information in the spaces provided.
  vii. ***Item* 11.** In case the downloaded application form (available on our website) is used, the applicant must send the Bank Draft along with the filled-in application form, after entering the Bank Draft details in this item.
  viii. ***Item* 12. 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 major subject of study at any stage, be sure to indicate it in the column marked "Subjects".

Any original documents or copies should not be sent with the application.

Submission of application: Completed applications must reach the following address by **06 MARCH 2013:**

DEAN OF STUDIES
ADMISSIONS 2013
INDIAN STATISTICAL INSTITUTE
203 BARRACKPORE TRUNK ROAD
KOLKATA 700 108

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

Admit Card: After the applications are processed, the Admit Card for the Admission Test, with the Registration Number, will be generated. Those, who have submitted the form by hand/post, will receive the admit card at the address mentioned in his/her application form, together with Instructions to the Candidates, addresses of the Admission Test Centres, Sample Questions and/or the Syllabi for the Admission Test that he/she has opted for. Those who have applied online, will receive a link containing the above information in his/her account and will need to take printouts of the same. In all subsequent correspondence, the applicant should quote the *Registration Number* without which no correspondence will be entertained.

The Selection Test is scheduled to be held on **Sunday, 12 May 2013**.

In case the admit card is not received by April 26 2013, send an e-mail to isiadmission@isical.ac.in with your name, form no. or Bank draft details. In the event that the Admit Card is not received by the date of the selection test, the candidate should proceed to the Admission Test Centre of his/her first preference, with any communication received from ISI, such as Acknowledgement Card, etc. A recent stamp-sized photograph must also be carried together with valid photo identity proof. The candidate may be allowed to write the Admission Test in case his/her name appears in the list of candidates sent to the supervisor of the Centre.

Note: 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.

Note: **Any dispute concerning ADMISSIONS in 2013-2014 shall be settled in Kolkata subject to the jurisdiction of the Kolkata High Court.**

INDIAN STATISTICAL INSTITUTE

APPLICATION FOR ADMISSION 2013-2014

(Read instructions carefully before filling in the form)

For Office Use Only

Form No.:

For Office Use Only

Paste Stamp Size Photograph

Do not Staple

Put your signature in the above box

1. Full Name (in CAPITAL letters):

2. Address for Correspondence (in CAPITAL letters): *[Please leave a box between two words]*

PIN :

STATE : COUNTRY :

TEL. NO. (including STD code)/MOBILE NO.

E-mail (if any):

3. Date of Birth : day month year

4. Sex: (**M**ale/**F**emale/ **O**ther) 5. Nationality :

6. Caste: (General/SC/ST/OBC)

(See Section 4, page 8 of the Prospectus)

7. Physical Disability (if any) : (Y/N) If yes, percentage of disability :

(See Section 4, page 8 of the Prospectus)

8. Course Code: 1st preference 2nd preference

(For Course code see page 42 of the Prospectus.) (Valid only for B Stat & B Math)

9. City Code: 1st preference 2nd preference 3rd preference

(See page 43 of the Prospectus)

10. (a) Are you an INMO awardee? (Y/N) If yes, year of award :

(for B Stat and B Math only. See pages 9 and 10 of the Prospectus.)

(b) Do you have a valid GATE score? (Y/N). If yes*, then All-India rank :

Subject : Year :

Marks out of 100 GATE Score:

* ***Must*** *enclose a copy of his/her GATE score card containing all the above information.*

(c) Are you appearing# for GATE in 2013 ? (Y/N).

*# **Must** send a scanned copy of his/her GATE score card containing all the above information by e-mail to isiadmission@isical.ac.in mentioning ISI Regn No. by 13 April 2013.*

11. Bank Draft No. : Amount in ₹

(If you have downloaded this form, also attach the Bank draft with the filled-in Application Form.)

Bank Name : Draft Date :

12 (a). Academic Record: Give details of all academic examinations in which you have passed/appeared indicating % of marks/ GPA and class in appropriate columns.

Examination (Put √ in the appropriate box)	University/ Board	Year of passing	Subjects (indicate Hons/Major)	Total Marks Obtained (%)/ GPA	Math Marks (%)/ GPA	Stat. Marks (%)/ GPA	Class / Division
☐ Secondary/ (or equivalent)							
☐ Higher Secondary (or equivalent)							
☐ Humanities (BA) ☐ Science (B Sc) ☐ Engineering (BE/B Tech) ☐ BCA							
☐ Humanities (MA) ☐ Science (M Sc) ☐ Engineering (ME/M Tech) ☐ MCA ☐ Others (specify)							

(a) Other Academic Achievements, if any :

(b) If you are yet to complete the qualifying examination, give the probable month of

(i) completion of the examination including practicals :

(ii) announcement of results :

13. Have you ever been admitted to a course at the Indian Statistical Institute? ☐ (Y/N)

If yes, then Course(s) Session :

14. Father's Name : Occupation :

15. Mother's Name : Occupation :

16. Guardian's Name Relationship:

Address : Tel:

17. If you are employed

(a) Employement Status :

(b) Designation :

(d) Employer's Address :

(e) Experience (if any) :

Declaration to be signed by the applicant:

The above particulars submitted by me are correct. If admitted, I shall not (a) leave in the middle of the course, (b) violate the discipline code of the Institute, or (c) indulge in any activity hampering the progress of my studies and spoiling the environment of the Institute.

Date : . . . . . .

Signature of the applicant with date

NB: Filled-in Application Form should reach Dean of Studies, Admission 2013, Indian Statistical Institute, 203 B T Road, Kolkata 700 108 in a sealed A4 cloth envelope by 06 March, 2013.

Important Dates:

Issue of application forms from • **ISI Offices** • **ISI website** **Online application**	Starts: **February 05, 2013** Ends: **March 01, 2013**
Submission of forms • **online** • **by hand** • **post**	Starts: **February 05, 2013** Ends: **March 06, 2013**
ISI ADMISSION TEST	**May 12, 2013**

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