

2025-26

Regular Course on STATISTICAL THEORY AND APPLICATIONS  
77<sup>th</sup> Term

**PROSPECTUS  
and  
WELCOME BROCHURE**



**INTERNATIONAL  
STATISTICAL  
EDUCATION  
CENTRE**

C. D. Deshmukh Bhawan  
202 B. T. Road  
Kolkata 700 108, INDIA



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on  
**STATISTICAL THEORY AND  
APPLICATIONS**

77<sup>th</sup> Term (2025 – 26)

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**INTERNATIONAL STATISTICAL EDUCATION CENTRE**

An Associate Institution of Indian Statistical Institute  
and

A Partner Institution of ITEC, Ministry of External Affairs, Government of India

C. D. Deshmukh Bhawan  
202 B. T. Road  
Kolkata 700 108, INDIA

# INTERNATIONAL STATISTICAL EDUCATION CENTRE

An Associate Institution of Indian Statistical Institute

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Telephone: (91) (33) 2575-2028/2027/2016

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INDIAN STATISTICAL INSTITUTE  
203 Barrackpore Trunk Road, Kolkata 700 108, INDIA

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# INTRODUCTION

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## INTERNATIONAL STATISTICAL EDUCATION CENTRE

The International Statistical Education Centre (ISEC) is an Associate Institution of the Indian Statistical Institute.

The ISEC was founded in 1950 through the initiative of Prof. P. C. Mahalanobis and is currently run by the Indian Statistical Institute under the auspices of the Government of India. It was opened in Calcutta (now Kolkata) by an agreement between the International Statistical Institute and the Indian Statistical Institute. According to the agreement made between the two Institutes, the latter placed its existing facilities for teaching and training at the disposal of the Centre. The International Statistical Institute agreed to provide the services of teachers from outside India to the maximum extent possible either by direct payment from UNESCO grants or by arrangements with various national or international organizations. Currently, the International Statistical Institute is not involved with the ISEC. Beginning with the third term of the ISEC Programme, the Central Statistical Office of the Government of India (GOI) is collaborating with the ISEC by organizing courses on Official Statistics.

The centre operates under a Board of Directors. Prof. P. C. Mahalanobis was the Chairman of the Board since the beginning till his demise in 1972. He was succeeded by Prof. C. R. Rao who continued till October 2015. Prof. S. P. Mukherjee took over the chairmanship of the ISEC Board of Directors in November 2015. On behalf of the Board of Directors, the Member-Secretary shoulders the responsibilities of selecting the candidates for various courses and conducting the Regular and the Special Courses with the collaboration of different wings of the Indian Statistical Institute and the Central Statistical Office of the Government of India. He/she also participates in the teaching programme.

Participants for the courses offered by ISEC in the past were selected from a large number of applicants from the following countries:

Afghanistan, Australia, Bangladesh, Bhutan, Brunei, Cambodia, Republic of China (Taiwan), Cuba, Egypt, Ethiopia, Fiji Islands, Gambia, Georgia, Ghana, Grenada, Hong Kong, Indonesia, Iran, Iraq, Israel, Ivory Coast, Japan, Kazakhstan, Kenya, Republic of Korea, Laos, Liberia, Malawi, Malaysia, Maldives, Mali, Mauritius, Mongolia, Myanmar, Namibia, Nepal, New Zealand, Niger, Nigeria, Oman, Pakistan, Papua, New Guinea, People's Republic of China, Philippines, Republic of Russia, Sierra Leone, Seychelles, Singapore, Somalia, Republic of South Africa, South Sudan, Sri Lanka, St. Christopher and Nevis (W. Indies), St. Lucia (W. Indies), Sudan, Swaziland, Syria, Tanzania, Thailand, Tonga, Uganda, United Arab Emirates (Abu Dhabi), Uzbekistan, Venezuela, Vietnam, Western Samoa, Zambia.

The number of countries represented each year has been, on an average, about ten in recent years. Given the ISEC objectives, candidates from the three stated groups (given below) in India are also encouraged to take part in the ISEC programmes.

## Objectives

The main purpose of the Centre is to provide regular and special courses in theoretical and applied statistics at various levels to selected international participants from the developing countries in general, and the countries of the Middle East, South and South-East Asia, the Far East, and the Commonwealth Countries of Africa in particular. Today, the ISEC accepts participants from all over the

world. The Centre also provides facilities for research work and advanced studies to senior visiting statisticians from abroad.

Trainees usually belong to one of the following groups:

- A – Officials from national statistical offices and other government departments and from business organizations who have experience in statistical work;
- B – Teachers and research workers in Statistics from universities and other institutions;
- C – Officials in non-statistical fields, desiring to acquire knowledge in Statistics.

## **Courses**

The regular course on STATISTICAL THEORY AND APPLICATIONS has been conducted successfully for the past 76 terms. At present, the duration of this course is ten months. Its syllabus has been revised with the emphasis being on the methodology and applications, rather than on the theory. The course will be held physically at the ISEC Campus, Kolkata, India.

Duration of special courses vary according to the needs of the trainees. Most of the candidates are officials from national statistical offices and other government departments or from financial and other business organizations.

## **Teachers**

Teaching at the Centre is undertaken by members of the staff of the Indian Statistical Institute, visiting teachers, and by experts in collaboration with the statistical offices of the various Ministries of the Government of India through the Ministry of Statistics and Programme Implementation and through such bodies as the Reserve Bank of India.

## **Teaching Facilities**

The teaching programmes are arranged through a collaboration between the Indian Statistical Institute and the Ministry of Statistics and Programme Implementation of the Government of India. All the facilities of the Indian Statistical Institute at Kolkata are made available to the Centre, including classrooms, study rooms, a computation and data processing centre containing variety of equipment including electronic computers, a circulating library (with a rich collection of story books and novels) and a central library of more than 200,000 up-to-date volumes, past and current professional journals, and international and national reports from all over the world. The Centre is in close touch with all branches of work of the Indian Statistical Institute.

# Course on STATISTICAL THEORY AND APPLICATIONS

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Seventy-Seventh Term (August 2025 – May 2026)

## Number of participants

The proposed maximum intake for this term is 19 (nineteen).

A limit on the number of enrolments in the Centre is placed in order to ensure adequate attention to the educational needs of individual participants. In previous years, about 20 candidates per year on an average have been admitted, which depends on the Scholarship approved by Ministry of External Affairs (Government of India).

## Time Schedule

The 77<sup>th</sup> Term of the Regular Course will commence on 1<sup>st</sup> August 2025 and will continue till the end of May 2026. Participants are expected to arrive in Kolkata a few days prior to the commencement of the course, in order to make personal arrangements.

## Essential Qualifications

In view of the varying needs of countries in Asia, Africa and the Far East for training statisticians, the Centre has set only some minimum prerequisites for admission. Flexibility in the instruction provided ensures that candidates need not have knowledge of advanced mathematics, but they must have knowledge of mathematics up to what may be called the GCE A-Level<sup>1</sup>. Proficiency in high school Mathematics, especially high school algebra is essential if the candidates wish to derive real benefit from the course.

They must also be able to follow classroom instruction in English and express themselves clearly through spoken and written English. Applicants must be graduates, preferably below 35 years of age, and have a minimum of three years of experience of statistical work. They should be alert and serious about their career in statistics and capable of assuming increased technical responsibilities on their return. They should, of course, be in good health and be certified fit to undertake training in a foreign country. All candidates must declare their pre-existing medical illnesses, if any.

## Plan of Instruction

The language of instruction is English. The Regular Course will be conducted in four phases, which are outlined below:

**Phase I (August to November 2025):** This phase consisting of four months (17 weeks) will primarily be preparatory in nature and review background material and essential topics. The following subjects will be covered:

- 1) Mathematics
- 2) Descriptive Statistics
- 3) Data Processing I
- 4) Probability
- 5) Economic Statistics I
- 6) Sample Survey I
- 7) Statistical Methods I

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<sup>1</sup>GCE Advanced Level Mathematics (Please visit <https://www.cambridgeinternational.org/Images/597421-2023-2025-syllabus.pdf> to get an overview of the current syllabus)

**Phase II (from December to mid February 2026) (11 weeks)** The following subjects will be taught:

- 1) Demography
- 2) Statistical Method II
- 3) Sample Survey II
- 4) Data Processing II
- 5) Economic Statistics II

**Phase III (Mid – February 2026 to Mid March 2026) (4 weeks):** This phase involves training in Official Statistics conducted by the CSO and other Government organizations, part of which may be in New Delhi.

This part of the course offers the participants an opportunity to become acquainted with the basic concepts, definitions and classifications of all principal subjects of official statistics. The methods of data collection are also discussed, with particular reference to the conditions prevailing in developing countries. Conceptual problems are covered using the international standards recommended by the United Nations and other international agencies, as a basis. Emphasis is placed upon the development of an integrated system of economic and social statistics.

The curriculum will normally cover the following subjects, but the course may be modified depending upon the specific needs of the trainees:

1. Agricultural statistics.
2. Capital formation statistics.
3. Index numbers of prices.
4. Social statistics.
5. Balance of payments statistics.
6. Public finance statistics.
7. National income statistics & related studies.
8. Transport statistics.
9. Money and banking statistics.
10. Wholesale and retail sales statistics.
11. Population and vital statistics.
12. Education and cultural statistics.
13. Foreign trade statistics.
14. Industrial statistics.

**Phase IV (Mid-March 2026 to May 2026) (9 weeks):** One of the following specializations is to be chosen:

- 1) Statistical Data Analysis
- 2) Applied Sample Surveys
- 3) Price Statistics
- 4) System of National Accounts
- 5) Economic Development
- 6) Time Series Analysis
- 7) Vital Statistics & Demography

All the specialization may not be offered in a particular year. The mode of instruction will consist of classroom lecture sessions followed by practical/tutorial sessions. A monthly session on discussion/presentation is encouraged. There will be practical classes and trainees are encouraged to make presentations of their projects, especially in Phase IV.

## **Assessment**

An examination will be held after each phase. Assignments and class tests are also held to evaluate the performance of the trainees. A mid-term test is during Phase I. The weightage for the mid-term test, end-term examination, assignments, class tests etc. will depend on the faculty. However, the weightage scheme will be announced before hand.

Outlines of the syllabi for the different courses are given in APPENDIX A.

## Study Tour

An educational-cum-sightseeing study tour forms an important part of this course. The funding agency, ITEC, expects that participants in all courses funded by it should be taken on educational study tours as part of their course curriculum. Visits can include different Indian heritage sites and places of interest located in the geographical vicinity of the partner institute. Participation in the study tour is mandatory for all participants. Any exception must be reported to the MEA. ISEC generally arranges a 3–4-day study tour. ISEC bears the cost of transportation and accommodation. The tour generally involves first-hand exposure to various sample surveys being conducted at the venue as well as visits to places of interest in the vicinity.

## Diploma on satisfactory completion

Final examinations are held at the end of each of the four phases of the training programme. Class tests may also be held during the course for assessment of progress by the trainees. The pass mark in each subject is 40%. If a trainee obtains less than 45%, s/he can take a back paper examination to improve her/his score. However, the maximum marks that can be obtained in a back-paper examination is limited to 45%. The Backpaper examination will be within four weeks. In case a trainee misses a mid-term/end-term examination due to medical emergency, there is a provision to take a Supplementary Examination. However, the maximum marks that can be obtained in a Supplementary examination is limited to 60%.

- A candidate obtaining at least 80% in the aggregate and having passed all the subjects will be placed in First Class with Distinction.
- A candidate obtaining at least 60% but less than 80% in the aggregate and having passed all the subjects will be placed in First Class.
- A candidate obtaining less than 60% in the aggregate and having passed all the subjects will be placed in Second Class.

Candidates who satisfactorily attend and complete the course, but do not pass the examinations, are awarded a Certificate of Attendance.

## Convocation

A Convocation is held at the end of the course, in which the successful participants are awarded their diplomas. For the participants in the 77<sup>th</sup> Term, the Convocation will be held in the last week of May 2026.

## Expenses of participants

Participants receiving support from the Ministry of External Affairs, Government of India, under the schemes listed in the next paragraph, can meet their costs for travel to, from and within India, and their living costs and other necessary items, from the grant. A modest living allowance presently at the rate of ₹ 1,200/- per day is provided to each trainee while in India. Disbursal is done on a monthly basis. Each trainee is assisted in opening a bank account to which the monthly living allowance is credited. Generally, the first month's allowance is delayed, so trainees should carry enough cash to manage their expenses for at least the first month of the course.

The ISEC will provide three meals to the trainees daily. As a partial compensation for such costs, the ISEC will deduct 50% of the living allowance (i.e ₹ 600/- per day presently) for this purpose **irrespective of whether a trainee takes these meals or not.**

## Training Grants

In previous years, some candidates attending the Centre have been financially supported by their respective national governments. Others have availed themselves of fellowships or scholarships awarded by the United Nations and other international organizations like the Commonwealth Fund for Technical Co-operation, Asian Development Bank, etc., as also by the Government of India.

For the Regular Course, some of the possible training grants are the following:

The Government of India offers a number of fellowships (see below) to be awarded to selected candidates under the Indian Technical and Economic Cooperation (ITEC), the Special Commonwealth African Assistance Plan (SCAAP), and the Technical Co-operation Scheme (Colombo Plan). Facilities under these fellowships are as follows:

1. Fares: Air passage from port of embarkation in the home country to Kolkata and back inclusive of road journey from Kolkata Airport to the place of training.
2. Living allowance: ₹1200/-per trainee per day for ten months in India. However, ISEC will deduct 50% of the living allowance (i.e ₹ 600/- per day) as Meal Charges, irrespective of whether a trainee takes the meals or not.
3. Book allowance for the purchase of relevant books and academic materials, which they can retain as the nucleus of a professional library upon returning to their countries. These purchases must be made in India and appropriate bills submitted for reimbursement. The amount sanctioned for book allowance (including the Welcome Kit) is ₹5000/-per trainee at present.
4. Study tour expenses: accommodation, conveyance, etc. for Study Tour within India during the ten-month training.

Candidates who require such training grants should obtain the particulars from awarding authorities and make efforts sufficiently in advance with the help of their governments or employers to secure the grants. Information is given below about some of the training grants offered by the Government of India.

### The Indian Technical and Economic Co-operation (ITEC) Programme

Technical Assistance by the Government of India is offered to ITEC-partner countries under the ITEC programme for attending the ISEC course. Providing grants for training in India is one of the six components of the ITEC.

### The Special Commonwealth African Assistance Plan (SCAAP)

The Government of India also offers a number of grants for training of foreigners in India under the Special Commonwealth African Assistance Plan (SCAAP). This is a programme of assistance meant for Commonwealth Countries in Africa. Classification of fellowships/scholarships, terms and conditions are similar to those of the Colombo Plan training grants (see Part c. below). Only officially sponsored candidates are eligible for these training grants.

### Colombo Plan Training Grants (TCS of Colombo Plan)

The Technical Cooperation Scheme (Colombo Plan) of the Government of India has been brought under the administrative control of the Ministry of External Affairs, Government of India.

For detailed information, kindly visit the website of the Ministry of External Affairs (MEA), Government of India at <http://itec.mea.gov.in/>. Information regarding these grants may also be obtained from the Indian Mission in each country.

### Accommodation

The Indian Statistical Institute maintains the ISEC Guest House in the Institute premises in Kolkata exclusively for the ISEC trainees, and all trainees are offered accommodation in the ISEC Guest House. The present accommodation charge in the ISEC Guest House is ₹ 600/- per day which is borne by the selected applicants through the grant provided by the funding agency.

### Medical Insurance

Since the duration of the course is long, each of the participants will be compulsorily enrolled in the Medical Insurance Scheme extended to the regular students of the ISI. **The insurance premium will be deducted from the living allowance.**

## SPECIAL COURSES (Individual Basis)

### Scope

For persons having some prior background in statistics already and having interest in specializing in some branches of statistics may not attend the Regular Course. There are facilities for Special Courses, offered on individual basis. Special Courses may also be offered to the candidates at lower levels. The duration of such courses is usually less than six months. A candidate can opt for such a course at any time of the year, provided he/she is sponsored with required financial support.

### Subjects for specialization

Subjects in which such special courses are provided may be mathematical or non-mathematical, theoretical or applied. These courses may be offered through lectures and lecture-cum-practical sessions or through in-service training involving participation in on-going projects in some departments of the Indian Statistical Institute or at the Department of Statistics, Government of India or at other departments/wings of the Government of India. A participant may also decide to do research work on a selected topic.

During **2025-2026**, ISEC will offer the following ITEC-sponsored special courses:

1. Workshop on Statistical Quality Control Techniques
2. Conducting Household Surveys - Sampling Methodologies and Analyses
3. Workshop On Data Needs For Planning Sustainable Development
4. Data Analytics for Decision-Making

Participants of the Special Courses are put up at the M G K Menon Guest House at the ISI Campus. Charges for boarding and lodging are as per ITEC and ISI rules.

Other special courses may be requested. ISEC can also conduct a course for a group of participants abroad, if requested. Others special courses once approved will be announced in the web.

## Training grants

The type of fellowship or scholarship, obtainable for candidates intending to take part in such courses, will depend on the candidate's professional status in the home country and the level at which training will be given. The ISEC does not take any responsibility of arranging training grants for the candidates. The candidates may try to obtain grants from UNFPA, ADB, Commonwealth Secretariat, etc., for this purpose.

## Course fee

A course fee of US \$ 2,000 per month per trainee is charged for Special Courses. The course fee does not include to-and-fro airfare, internal travel costs, living allowances, etc. Besides, there are other charges such as local transport, accommodation, etc., which comprise US\$ 1,500 per month per trainee excluding the living expenses, internal travel costs, etc. To-and-fro air fare, living expenses, internal travel costs, etc. are to be paid by the sponsoring agencies. The course fee and other charges, amounting to a total of US \$ 3,500 per month per trainee, have to be transferred electronically to the bank account of the Indian Statistical Institute, Kolkata at least one month before the commencement of any special course.

## APPLICATION PROCEDURE

All applications for admission to a Course and/or any Government of India Fellowship should be forwarded through the respective Indian Missions.

## Admission

All new applications for the Regular Course where the candidates wish to avail of ITEC scholarships have to be filled in at [ITEC :Indian Technical and Economic Cooperation \(itecgoi.in\)](http://itecgoi.in) by the applicants themselves. They can choose their own login email ID and create their login password, which would be used to keep them posted of their application processing status. After a candidate has applied for a course, he/she must take a printout of the application and send it through the nominating ministry/organizations to the Indian Mission.

Before applying, interested individuals are requested to ensure that they meet the eligibility conditions.

Candidates sponsored by other agencies should write directly to the Member-Secretary at the address given in the Contact Details Section.

## Application Deadline

Applications for admission to the 77<sup>th</sup> Term of the Regular Course must be submitted online via the ITEC Portal ([ITEC :Indian Technical and Economic Cooperation \(itecgoi.in\)](http://itecgoi.in)) at the earliest, no later than **June 30, 2025**.

## IMPORTANT INFORMATION FOR PROSPECTIVE TRAINEES

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Note: Sponsoring authorities are urged to acquaint the candidates with the following items of information about the ISEC before forwarding the applications for admission. Further details about any specific item may be obtained on request.

1. The office of the Centre is located in the Indian Statistical Institute, 202 Barrackpore Trunk Road, C.D. Deshmukh Bhawan, Kolkata 700 108, India.
2. Normal working hours of the Centre is from 10 A.M. to 6.30 P.M. (local time).
3. The Centre is closed on all notified holidays (up to 17 days per year), Saturdays and Sundays.
4. The day-to-day activities of the Centre are carried out by a small number of staff, all of whom are employees of the Indian Statistical Institute and posted at the Centre, with Member-Secretary of the Board of Directors as its Head.
5. All the facilities at Indian Statistical Institute are made available to the Centre and use of such facilities are governed by the rules of the Indian Statistical Institute.
6. It is the responsibility of the selected candidate to report to the Centre for training before 1<sup>st</sup> August 2025. Guest House accommodation will be made available from July 31, 2025.
7. Airport pick-up and drop-off, free of charge, is arranged by the Centre provided travel itinerary is intimated by email to [isec@isical.ac.in](mailto:isec@isical.ac.in) at least five working days in advance.

The Indian Statistical Institute maintains a Guest House at the Institute campus in Kolkata in which rooms are reserved for the ISEC trainees.

8. Each room is air-conditioned, is for single occupancy and is moderately furnished.
9. Rooms are allotted on a first-come first-served basis.
10. Cooking is strictly prohibited in the rooms.
11. Consumption of alcohol is not allowed in the Guest House.
12. Visitors of opposite sex are not allowed in the rooms of the trainees.
13. Trainees are not allowed to bring along their spouses or families during the duration of the course.
14. All trainees must adhere to the rules and the regulations of the Guest House.
15. The Indian Statistical Institute provides cooks and service boys to serve food to the trainees of the Centre at the ISEC Guest House.
- 16. There is no facility for cooking by the trainees themselves. Beef and pork are not allowed/served in the Guest House.**
17. There is also no facility to cook food exclusively for vegetarians.
18. The ISEC Guest House, office, class rooms and corridors are under CCTV surveillance.
- 19. The trainees will be provided training at different centres, institutes, fields offices, government offices during these 10 month of stay, where they have to abide by the rules set by the local administration.**

The trainees of the Centre are allowed to become members of the Indian Statistical Institute Library free of charge and they are treated as equivalent to the Indian Statistical Institute students for use of library facilities. The trainees may also become members of the Indian Statistical Institute Club and the Circulating Library upon payment of yearly (January-December) subscription and admission

fee.

The trainees are responsible for keeping their travel documents validated and for following all immigration regulations. Possession of foreign currency, without valid documents, is illegal in India. Foreign currency should be declared, and the declaration should be certified by the Indian Customs at the time of arriving in India.

Indian Missions in the respective countries should be requested to issue:

- multiple entry visas
- endorsement regarding exemption from 'Reporting to FRRO'

Participants should obtain the required transit visas, if any, on their own.

## Contact Details

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**International Statistical Education Centre**  
**202 Barrackpore Trunk Road,**  
**Kolkata 700 108**  
**INDIA**

**Telephone: (91) (33) 2575 2028 /**  
**2027 /2016 ( 3 lines)**  
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# ANNEXURE A

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## SYLLABI FOR TOPICS OF INSTRUCTION

### Phase I (August – November 2025)

#### Mathematics (Theory: 30 Lectures Practical: 20 Lectures)

Review of Fundamentals. Solutions of Linear Equations in two variables. Graphs of Simple Functions. Laws of Indices. Permutations and Combinations. Common and Natural Logarithms. Linear Interpolation. Matrices and Determinants, Elements of Set Theory, Introduction to Differential and Integral calculus with applications.

**References:**

Goldie, S; Moore, C; Hanrahan, V; Muscat, JP & Whiteouse, S. A Level Mathematics Year I (4th Edition).

Linsky, J; Nicholson, J & Western, B. Complete Pure Mathematics 1 (for Cambridge International AS & A Level)

#### Descriptive Statistics (Theory: 30 Lectures Practical: 20 Lectures)

Basic concepts and definitions. Role of Statistics – uses and misuses. Variable types. Tabular and diagrammatic representation of data. Central tendency and dispersion – concepts and measures. Moments and measures of skewness and kurtosis. Frequency table and plots for bivariate data. Concept of covariance. Pearson’s correlation coefficient. Rank correlation.

**References:**

Gun, AM; Gupta, MK; & Dasgupta, B: Fundamentals of Statistics Vol. 1 (World Press)

Rohatgi, VK & Saleh, AKME: An Introduction to Probability and Statistics

Stine, R & Foster, D: Statistics for Business: Decision Making and Analysis

Holcomb, Z: Fundamentals of Descriptive Statistics (Routledge)

Freedman, D; Pisani, R; Purves, R & Adhikari, A: Statistics (W W Norton & Company, Inc. New York)

Mills, FC: Statistical Methods. (Sir Issac Pitman & Sons, London)

#### Data Processing I (Theory: 30 Lectures Practical: 20 Lectures)

Fundamentals of Computers: Spreadsheet, Concept of Database. MS Access. Generation of Tables using MS Excel. Statistical computation using MS Excel.

Introduction to R.

**References:**

Harvey, G: Excel 2019 for Dummies (John Wiley & Sons)

Winston, W: Microsoft Excel 2019 for Data Analysis & Business Modelling, 6th Edition. (Pearson Educational Inc.)

## Probability (Theory: 30 Lectures Practical: 20 Lectures)

Random experiments. Sample space. Concept of classical theory of probability. Elements of combinatorics. Related problems from classical theory. Probability of union of events. Conditional probability and independence of two or more events. Total Probability. Bayes' Theorem. Random variables. Discrete and continuous random variables. Expectation, Variance. Special distributions including binomial, Poisson and normal distribution. Joint distributions of two random variables. Conditional distributions. Independence of two random variables. Covariance and correlation coefficient. Conditional expectation and variance. Law of large numbers and central limit theorem (statements only).

### References:

Devore, JL: Probability and Statistics for Engineering and the Sciences.

Rukmangadachari, E & Reddy, EK: Probability and Statistics

Ross, SM: Introduction to Probability Models

## Economic Statistics I (Theory: 30 Lectures Practical: 20 Lectures)

Review of Official Statistics: General Scope & Coverage of Official Statistics; Fundamental Principles of Official Statistics; Domains of official statistics; Overview of National Statistical Systems (NSSs) and role of National Statistical Offices (NSOs).

Scope and Coverage of Economic Statistics: Economic accounts, Sectoral statistics and other economic statistics.

Industrial Standards: Standard International classifications used for compilation of economic statistics – International Standard Industrial Classification (ISIC Rev. 4); Central Product Classification (CPC Version 2.1), Purpose Classifications, Standard International Trade Classification (SITC), Rev. 3.

Major Sources of Data: Administrative data, Business Registers, Economic surveys, Economic Census and use of area frame.

A Brief Overview of Sectoral Statistics: Agriculture, forestry, fisheries; Mining, Manufacturing, Energy

& construction, Domestic Trade and Transport, Banking, insurance, financial statistics, Government finance statistics, and Services sector statistics.

Introduction to Other Economic Statistics: Employment & Labour, Prices, A brief overview of Merchandise trade statistics and Statistics on International Trade in Services.

System of National Accounts 2008-Basic Macro-economic framework: (i) National Income Identity, (ii) Circular flow of Income and (iii) Product, labour and money market.

SNA Basic Concepts:(i) Domestic economy and institutional sectors, (ii) Economic assets and economic flows, Production & Assets boundary, (iii) Kinds of transactions, (iv) Valuation – Taxes & subsidies and basic, producers and purchasers' prices, Three Approaches of measuring GDP & related concepts and an overview of Macro-economic aggregates at constant-prices.

## References:

National Accounts: A Practical Introduction. United Nations, New York, 2003  
Business Registers - Recommendations Manual. EUROSTAT, 2010  
International Standard Industrial Classification of All Economic Activities, Revision 4. United Nations, New York, 2008.  
Classifications of Expenditure according to Purpose. United Nations, New York, 2000.  
International Recommendations for Industrial Statistics. United Nations, New York, 2008.

## Sample Surveys – I (Theory: 32 Lectures Practical: 16 Lectures)

Introduction to the terms: Population, units, sample. Objectives of sample surveys, and benefits of sample surveys versus census.

The need for probability sampling; Sampling versus non-sampling errors; Types of Non-sampling errors, Assessment and control of non-sampling errors.

An overview of principal steps in planning and conducting a sample survey. Methods of drawing a sample and data collection. Preparation of questionnaires/schedules.

Simple Random Sampling with replacement (SRSWR), Simple Random Sampling without replacement (SRSWOR), Examples, Use of random numbers to draw SRSWR and SRSWOR.

Idea about all possible samples and sampling distribution of an estimator intending to estimate population mean and total. Idea about unbiasedness of an estimator. Concept of sampling variance and standard error of an estimator. Determination of sample size.

Stratified sampling and its use/advantages with examples. Estimation of population mean and total. Estimator for standard error. Allocation of sampling units to strata.

Systematic sampling - method and relevant estimators.

## References:

Bethlehem, J: (2009). Applied Survey Methods: A Statistical Perspective. (John Wiley & Sons).  
Chaudhuri, A: (2010). Essentials of Survey Sampling. (Eastern Economy Edition. PHI Learning Pvt. Ltd).  
Cochran, WG: (1977). Sampling Techniques, 3<sup>rd</sup> Edition. (John Wiley & Son.)  
Groves, RM; Fowler, FJ; Couper, MP; Lepkowski, JM; Singer, E & Tourangeau, R: (2010). Survey Methodology, 2<sup>nd</sup> Edition. (John Wiley & Son.)  
Kish, L: (1995). Survey Sampling (Wiley, New York.)  
Lohr, S: (2010). Sampling: Design and Analysis. 2<sup>nd</sup> Edition. (Brooks/Cole, Boston.)  
Thompson, SK: (1992). Sampling (John Wiley & Son).

## Statistical Methods I (Theory: 20 Lectures Practical: 10 Lectures)

Concept of population and sample. Notion of statistic, sampling distribution and standard error of a statistic. Properties of sample mean and sample proportion. Concept of estimation: Point and Interval Estimation. Methods of Estimation: Moments, MLE. Properties of Estimators - unbiasedness.

**References:**

Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 1 (World Press)  
Hogg, RV; Tanis, EA & Zimmerman, DL: Probability and Statistical Inference (Pearson)  
Mills, FC. Statistical Methods. (Sir Isaac Pitman & Sons, London)  
Rice, JA: (2007) Mathematical Statistics and Data Analysis, 3<sup>rd</sup> Edition (Thomson and Brooks Cole).  
Rohatgi, VK & Saleh, AKME: An Introduction to Probability and Statistics  
Stine, R & Foster, D: Statistics for Business: Decision Making and Analysis

**Phase II (December 2025 to mid February 2026)****Data Processing II (Theory: 16 Lectures Practical: 9 Lectures)**

Basic concepts of networks. SQL. Use of R software for solving statistical problems including processing of survey data.

**References:**

<https://www.w3schools.com/sql>  
<https://www.javatpoint.com/sql-tutorial>  
[https://www.tutorialspoint.com/data\\_communication\\_computer\\_network/data\\_communication\\_computer\\_network\\_tutorial.pdf](https://www.tutorialspoint.com/data_communication_computer_network/data_communication_computer_network_tutorial.pdf)  
Everitt, BS & Hothorn, T. A Handbook of Statistical Analyses Using R.  
Kundu, S. Fundamentals of Computer Networks  
Nield, T: Getting Started with SQL

**Sample Surveys – II (Theory: 16 Lectures Practical: 9 Lectures)**

Estimation of population proportion in SRSWR and SRSWOR. Estimation of population total, mean, proportion and ratio in probability proportional to size sampling. Ideas about Cluster sampling,  
Multistage sampling. Non-contact, non-response follow-ups and/or adjustment. Post-survey adjustments. Examples of large-scale surveys, including household surveys, establishment/enterprise surveys and crop estimation surveys, factory surveys, etc.

**References:**

Bethlehem, J: (2009). Applied Survey Methods: A Statistical Perspective. (John Wiley & Sons).  
Chaudhuri, A: (2010). Essentials of Survey Sampling. (Eastern Economy Edition. PHI Learning Pvt. Ltd).  
Cochran, WG: (1977). Sampling Techniques, 3rd Edition. (John Wiley & Son.)  
Groves, RM; Fowler, FJ; Couper, MP; Lepkowski, JM; Singer, E & Tourangeau, R: (2010). Survey Methodology, 2nd Edition. (John Wiley & Son.)  
Kish, L: (1995). Survey Sampling (Wiley, New York.)

Lohr, S: (2010). Sampling: Design and Analysis. 2nd Edition. (Brooks/Cole, Boston.)

Thompson, SK: (1992). Sampling (John Wiley & Son).

### Statistical Methods II (Theory: 17 Lectures Practical: 8 Lectures)

Testing of hypothesis, notion of null and alternative hypotheses. Two Types of Error in Tests of Hypotheses. Large sample tests and confidence interval for means and proportions in one- and two-sample problems. Level of significance. Test for zero correlation. One-way ANOVA (Analysis of Variance).

#### References:

Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 1 (World Press) Hogg, RV;

Tanis, EA & Zimmerman, DL: Probability and Statistical Inference (Pearson)

Mills, FC. Statistical Methods. (Sir Isaac Pitman & Sons, London)

Rice, JA: (2007) Mathematical Statistics and Data Analysis, 3rd Edition (Thomson and Brooks Cole).

Rohatgi, VK & Saleh, AKME: An Introduction to Probability and Statistics

Stine, R & Foster, D: Statistics for Business: Decision Making and Analysis

### Economic Statistics II (Theory: 15 Lectures Practical: 10 Lectures)

Economic Indicators: (i) Human Development Index (HDI); (ii) Human Poverty Index (HPI); (iii) Measurement of labour productivity; and (iv) GDP deflator.

Economic Surveys: Choice of statistical units; Questionnaire design and survey techniques.

Index Numbers: Basic Concepts and Definitions. Commonly used Index Numbers including Consumers and Producers price index; Exports and Imports price index etc.

Fixed base and Chain base index numbers.

Time Series Analysis: Time Series data, objective of time series analysis (Decomposition analysis and Stochastic Analysis), Need for adjustments in time series. Components of Time Series - Secular Trend, Seasonal Variation, Cyclical Variation.

#### References:

Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 2 (World Press).

ILO/IMF/OECD/UNECE/Eurostat/The World Bank Consumer Price Index Manual: Theory and Practice. Geneva, International Labour Office, 2004

Chatfield, C: The Analysis of Time Series: An Introduction, 6th Edition. (Chapman and Hall/CRC).

### Demography (Theory: 17 Lectures Practical: 8 Lectures)

Scope and Importance of Demography. Data sources: Population Census, Vital Registration, Population Register, Demographic and Health Surveys, Other Sources. Limitations of the sources. Evaluation and adjustment of Census and survey data on Age-Sex distribution.

Growth of human population: Rate of natural increase, arithmetic, geometric and exponential Growths.

International Statistical Classification of Diseases and Related Health Problems, Injuries and Causes of Death. Measures Based on Diseases (i.e., Morbidity), Death (i.e., Mortality) and Birth (i.e., Fertility) Statistics Including Measures such as Infant Mortality Rate, Neonatal and post-neonatal Mortality Rates, Total Fertility Rate, Gross and Net Reproduction Rates, Mean Length of Generation, and Census Measures of Fertility.

Life Tables: Definition, Simple Construction and Applications. Concept of Migration.

#### References:

Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 2 (World Press).

Giri, PK & Banerjee, J: Statistical Tools and Techniques, 5th Edition (Academic Publishers, India).

Preston, SH; Heuveline, P & Guillot, M: Demography: Measuring and Modeling Population Processes (Wiley-Blackwell)

Ramakumar, R & Gopal, YS: Technical Demography (Wiley Eastern Ltd.).

Rowland, DT: Demographic Methods and Concepts (Oxford University Press)

Shryock, HS: The Methods and Materials of Demography (Vol - 1 & 2) JS Siegel and Associates. (U.S. Bureau of the Census, U.S. Govt. Printing Office, Washington, D.C.)

Spiegelman, M: Introduction to Demography (Harvard University Press)

Srinivasan, K: Training Manual on Demographic Techniques – (ORGI and UNFPA)

Srinivasan, K: Basic Demographic Techniques and Applications (Sage Publications, India).

## Phase III (mid February to mid March 2026)

### Official Statistics, Systems & Procedures

This part of the course offers the participants an opportunity to become acquainted with the basic concepts, definitions and classifications of all principal subjects of official statistics. The methods of data collection are also discussed, with particular reference to the conditions prevailing in developing countries. Conceptual problems are covered using the international standards recommended by the United Nations and other international agencies, as a basis. Emphasis is placed upon the development of an integrated system of economic and social statistics.

The curriculum will normally cover the following subjects, but the course may be modified depending upon the specific needs of the trainees:

1. Agricultural statistics.
2. Transport statistics.
3. Capital formation statistics.
4. Money and banking statistics.
5. Index numbers of prices.
6. Wholesale and retail sales statistics.
7. Social statistics.
8. Population and vital statistics.
9. Balance of payments statistics.
10. Education and cultural statistics.
11. Public finance statistics.
12. Foreign trade statistics.
13. National income statistics & related studies.
14. Industrial statistics.

## References:

- Statistical Yearbooks. Food and Agricultural Organization (FAO) Rome.  
<http://www.fao.org/economic/ess/ess-publications/ess-yearbook/en/#.XbgCz9xhmM8>FAO (2010). FAO Statistical Development, Series 12, Rome 2010.
- FAO (1989). Sampling methods for agricultural surveys. FAO Statistical Development Series 3, Rome,1989
- UN-DESA (2010). International Recommendations for Industrial Statistics 2008. United Nations, New York 2010.
- Balk, BM: (2008). Price and Quantity Index Numbers. (Cambridge University Press) Ralph, J.; O'Neill, R. & Winton, J: (2015). A Practical Introduction to Index Numbers. (John Wiley)
- ILO (2004). Consumer Price Index Manual: Theory and Practice 2004,  
[https://www.ilo.org/public/english/bureau/stat/download/cpi/cpi\\_manual\\_en.pdf](https://www.ilo.org/public/english/bureau/stat/download/cpi/cpi_manual_en.pdf)
- IMF Producer Price Index Manual 2004,  
<https://www.imf.org/external/pubs/ft/ppi/2010/manual/ppi.pdf>
- IMF (2005). Balance of Payments Manual. International Monetary Fund
- Cartas, J & Harutyunyan, AK: (2017). Monetary and Financial Statistics Manual and Compilation Guide. International Monetary Fund (IMF) 2017.
- IMF (2015). Government Finance Statistics Manual 2014. International Monetary Fund (IMF) 2015
- UN-DESA (2009). International Recommendations for Distributive Trade Statistics 2008. United Nations, New York 2009.
- UN-DESA (2010). Handbook on Population and Housing Census Editing Revision 1. United Nations, New York 2009.
- United Nations. The Follow-up Method in Demographic Sample Surveys.
- UNSD. Handbook of National Accounting – Accounting for Production: Sources and Methods
- UNSD. National Accounts: A Practical Introduction
- UNSD. Handbook of National Accounting – Input-Output Table Compilation and Analysis
- Kendrick, JW: (1996). The New System of National Accounts. (Kluwer Academic Publishers).

## Phase IV (Mid-March 2026 to May 2026)

This phase is devoted towards specialization. Each trainee has to choose one specialization. A subset of the specialization topics will be offered in a particular year. Each chosen specialization includes about 10 lecture hours and 20 contact hours for project related discussions. Four to six special/advanced topics from the specialization, depending on the need and interest of the trainee, would be selected for lectures followed by Project work. The specialization topics which may be offered are the following:

1. Statistical Data Analysis
2. Applied Sample Surveys
3. Price Statistics
4. System of National Accounts
5. Economic Development
6. Time Series Analysis
7. Vital Statistics & Demography

Brief outlines of the syllabi follow.

## Statistical Data Analysis

Fitting of Binomial, Poisson and Normal distributions. Chi-square goodness of fit test. Introduction to multiple regression analysis. Transformation of variables for regression. Nonparametric methods including sign test, Wilcoxon rank test and signed rank test. Project work.

### References:

Conover, WJ: Practical Nonparametric Statistics. 3<sup>rd</sup> Edition. (John Wiley)  
Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 1 (World Press)  
Rohatgi, VK & Saleh, AKME: An Introduction to Probability and Statistics  
Stine, R & Foster, D: Statistics for Business: Decision Making and Analysis  
Hogg, RV; Tanis, EA & Zimmerman, DL: Probability and Statistical Inference (Pearson)  
Mills, FC. Statistical Methods. (Sir Issac Pitman & Sons, London).  
Sprent, P: Applied Nonparametric Statistical Methods.

## Applied Sample Surveys

Recapitulation of topics from Sample Surveys – I & II. Cluster sampling and multistage sampling. Half- sampling and IPNS approach for variance estimation. Data processing for surveys. Project work.

### References:

Bethlehem, J: (2009). Applied Survey Methods: A Statistical Perspective. (John Wiley & Sons).  
Chaudhuri, A: (2010). Essentials of Survey Sampling. (Eastern Economy Edition. PHI Learning Pvt. Ltd).  
Cochran, WG: (1977). Sampling Techniques, 3<sup>rd</sup> Edition. (John Wiley & Son.)  
Groves, RM; Fowler, FJ; Couper, MP; Lepkowski, JM; Singer, E & Tourangeau, R: (2010). Survey Methodology, 2<sup>nd</sup> Edition. (John Wiley & Son.)  
Kish, L: (1995). Survey Sampling (Wiley, New York.)  
Lohr, S: (2010). Sampling: Design and Analysis. 2<sup>nd</sup> Edition. (Brooks/Cole, Boston.)  
Thompson, SK: (1992). Sampling (John Wiley & Son)

## Price Statistics

Compilation of Consumer Price Index (CPI) and Producers Price Index (PPI). Scope, coverage and uses of CPI & PPI; classification and weights; choice of index formula, base period; price collection – selection of outlets and products, periodicity, substitution; quality adjustment – Hedonic; other compilation issues. Project work.

### References:

Balk, BM: (2008). Price and Quantity Index Numbers. (Cambridge University Press)  
ILO/IMF/OECD/UNECE/Eurostat/The World Bank Consumer Price Index Manual: Theory and Practice Geneva, International Labour Office, 2004  
Ralph, J.; O'Neill, R. & Winton, J: (2015). A Practical Introduction to Index Numbers. (John Wiley & Sons) Ryan, WTL: Price Theory. (Macmillan).

Stigler, GJ: Theory of Price (Maxwell Macmillan International Library) Zieschang, KD: Framework of Price Statistics.

### System of National Accounts

Measuring production-, income- and expenditure aggregates in practice. Price, volume and value indexes and their use in compiling volume measures. Methods of working out constant-price estimates. Rebasement of national account series. Project work.

#### References:

Blades, DW & Lequiller, F: Understanding National Accounts. OECD 2006.

Ruggles, N & Ruggles, R: National Accounting and Economic Policy. (Edward Elgar, Yale University). Kendrick, JW. (1996). The New System of National Accounts. Kluwer Academic Publishers.

### Economic Development

Why Study Development Economics? Basic indicators of development, Millennium Development goals, Sustainable Development Goals. Theories of Economic Growth and Development: Rostow, Lewis, Dualistic Development thesis, Big Push, Harrod Domar Model, Solow model, Todaro Migration model. Malthusian Population trap. Living Standard Measurement. Measuring inequality and poverty: Absolute poverty, Head-count ratio and poverty gap measure, Lorenz curve and Lorenz ratio, Foster-Greer- Thorbeck Index. Multidimensional poverty measure. Size Distribution Analysis: Income and other size distributions and distributional inequality. Pareto and Lognormal distributions and fitting data. Project work.

#### References:

World Bank: Living Standard Measurement Study –  
<https://microdata.worldbank.org/index.php/catlog/lsms>

Todaro, MP & Smith, SC: Economic Development

Khandker, SR & Haughton, J: (2009). Handbook on Poverty and Inequality (World Bank Group Publications).

### Time Series Analysis

Decomposition Analysis- Components of Time Series: Secular Trend, Seasonal Variation, Cyclical Variation, Measurement of Secular Trend: Curve fitting, Moving Average, Method using mathematical curves, Measurement of Seasonal fluctuations: Method of monthly/quarterly Averages, Ratio to Moving average, Ratio to Trend Method, Method of link Relatives, Measurement of Cyclical Variation: Periodogram analysis, Stochastic Time Series Analysis: Fundamental Concepts. Project work.

#### References:

Brockwell, PJ & Davis, RA: (2002). Introduction to Times Series and Forecasting.

Chatfield, C: The Analysis of Time Series: An Introduction, 6th Edition. (Chapman and Hall/CRC) Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 2 (World Press).

## Vital Statistics & Demography

Rates, Ratios and Proportions for Computing Various Measures of Mortality, Fertility and Migration. Demonstration of the Measures Using Different Sources of Demographic Data: Registration, Population Census, Demographic Surveys.

Study of Life Tables and Applications of Model Life Tables. Measures of morbidity. Fertility Analysis. Birth Order, Parity and Parity Progression Ratio. Evaluation and Adjustment of Census and Survey Data on Population. Mortality – levels, trends and differentials, causes of death. Fertility – levels, trends and differentials. Factors Affecting Fertility. Migration and Urbanization. Standardization of Vital Rates. General Health Surveys: Items of Information Usually Collected, Methods of Survey. Health Programme Evaluation. Population Estimation, Projection & Policy.

Substantive Demography (findings of previous demographic research): Age Distribution of Population and Its Socio-economic Implications. Demographic factors in economic development, economically active and inactive population. Family planning movement in the context of economic development programmes. Project work.

### References:

Gun, AM; Gupta, MK & Dasgupta, B: Fundamentals of Statistics, Vol. 2 (World Press).

Giri, PK & Banerjee, J: Statistical Tools and Techniques, 5th Edition (Academic Publishers, India) Preston, SH; Heuveline, P & Guillot, M: Demography: Measuring and Modeling Population Processes (Wiley-Blackwell)

Ramakumar, R & Gopal, YS: Technical Demography (Wiley Eastern Ltd.). Rowland, DT: Demographic Methods and Concepts (Oxford University Press)

Shryock, HS: The Methods and Materials of Demography (Vol - 1 & 2) JS Siegel and Associates. (U.S. Bureau of the Census, U.S. Govt. Printing Office, Washington, D.C.)

Spiegelman, M: Introduction to Demography (Harvard University Press) Srinivasan, K: Training Manual on Demographic Techniques – (ORGI and UNFPA) Srinivasan, K: Basic Demographic Techniques and Applications (Sage Publications, India).

### Suggested URLs:

[http://iaseweb.org/islp/apps/gov\\_stats\\_populations/](http://iaseweb.org/islp/apps/gov_stats_populations/) [http://iaseweb.org/islp/apps/gov\\_stats\\_priceindices/](http://iaseweb.org/islp/apps/gov_stats_priceindices/) [https://iaseweb.org/islp/apps/gov\\_stats\\_populations/](https://iaseweb.org/islp/apps/gov_stats_populations/) [https://iaseweb.org/islp/apps/gov\\_stats\\_graphing/](https://iaseweb.org/islp/apps/gov_stats_graphing/) [http://cast.massey.ac.nz/init/public\\_about.html](http://cast.massey.ac.nz/init/public_about.html) <http://archive.stats.govt.nz>

[danielsoper.com](http://danielsoper.com) [vassar.edu](http://vassar.edu) [stattrek.com](http://stattrek.com)

<https://www.stats.otago.ac.nz>

<http://www.fao.org/economic/ess/ess-publications/ess-yearbook/en/#.XbgCz9xhmM8>

[https://www.ilo.org/public/english/bureau/stat/download/cpi/cpi\\_manual\\_en.pdf](https://www.ilo.org/public/english/bureau/stat/download/cpi/cpi_manual_en.pdf)

<https://www.imf.org/external/pubs/ft/ppi/2010/manual/ppi.pdf>

<https://www.w3schools.com/sql> <https://www.javatpoint.com/sql-tutorial>

[https://www.tutorialspoint.com/data\\_communication\\_computer\\_network/data\\_communication\\_computer\\_network\\_tutorial.pdf](https://www.tutorialspoint.com/data_communication_computer_network/data_communication_computer_network_tutorial.pdf)

<https://microdata.worldbank.org/index.php/catalog/lsm5>

## ANNEXURE B

### Country-wise Number of Officials Trained under the ISEC Regular Course during Last Ten Years

Sl. No.	Country	No. of Officials	Sl. No.	Country	No. of Officials
1	Afghanistan	23	21	Myanmar	23
2	Bangladesh	7	22	Maldives	4
3	Bhutan	3	23	Namibia	2
4	Cambodia	3	24	Niger	9
5	D.R. of Congo	4	25	Nigeria	2
6	Cuba	2	26	Oman	5
7	Ethiopia	4	27	Papua New Guinea	25
8	Fiji	11	28	Tajikistan	1
9	Gambia	8	29	Senegal	3
10	Georgia	1	30	Seychelles	2
11	Ghana	4	31	Sri Lanka	14
12	Grenada	2	32	South Sudan	8
13	Indonesia	1	33	Tanzania	7
14	Iran	4	34	Thailand	3
15	Ivory Coast	4	35	Venezuela	1
16	Kenya	2	36	Tonga	2
17	Laos	2	37	Uganda	1
18	Mauritius	21	38	Uzbekistan	2
19	Mongolia	3	39	Vietnam	2
20	Malawi	1	40	Zambia	4
41	Sierra Leone	1	42	Tunisia	2
43	Burundi	4	44	Madagascar	1