



Admission to M.Sc. Programs (2011-12)

in

- I. Actuarial Economics**
- II. Applied Quantitative Finance**
- III. Environmental Economics**

PROGRAMS

India Gandhi National Open University (IGNOU) invites applications for admission to 2-Year (4 Semesters) M.Sc. Programs in (i) Actuarial Economics, (ii) Applied Quantitative Finance, and (iii) Environmental Economics offered in collaboration with **Madras School of Economics** (MSE). These are full time on-campus professional programs to be offered from two centres, IGNOU, New Delhi and MSE, Chennai. The programs are designed to equip learners with specialized technical skills in the areas of (i) Actuarial science with a strong background in Economics, Finance, and Insurance, (ii) Finance with quantitative techniques, Economics theory and applied Finance, and (iii) Environmental Economics with applied quantitative techniques. On completion of these programs candidates are expected to enter the market as specialists in fields of insurance, finance and environment which have witnessed growing demand in recent years.

Background

- (i) **M.Sc. in Actuarial Economics:** Despite the growth of insurance sector in India in recent years, the number of qualified professionals has not increased. As a result, there is a shortage of trained actuarial professionals. Need for well trained personnel capable of applying mathematical, statistical and economic analysis to a wide range of decision-making processes in the fields of insurance, retirement and other benefits, and investments is increasingly felt. The program is designed keeping in mind research as well as practitioner's perspective.

Keeping in view the underlying processes of decision making under uncertainty in insurance, the program offers an intensive training in understanding economic and financial theories at the outset (first two semesters). Building upon such a background the last two semesters attempt to impart specialized skills in the field. Its uniqueness lies in drawing inputs from applied econometrics and advanced techniques in finance to form a robust combination with the techniques of actuarial

science. Such an approach helps generate a wide range of optional topics for the learners to choose from.

- (ii) **M.Sc. in Applied Quantitative Finance:** Emergence of financial market encompassing larger number of participants is increasingly demanding qualified financial analysts. Given the volatility of operations in financial market, the challenge of capturing the stylized facts of financial markets through effective models capable of generating precise results still persists. The program of Applied Quantitative Finance aims to develop such skilled financial analysts. The emphasis of courses in the program is geared towards presenting the central concepts in clear, analytical, mathematical and computational details to help tackle complicated situations in the field of finance.

The program is designed to offer an understanding of economic and financial theories at the outset (first two semesters) after which a learner specializes in the last two semester in specific areas from a list of elective courses comprising applied econometrics, stochastic models, advanced techniques in finance, financial instruments and markets, and artificial neural networks.

- (iii) **M.Sc. in Environmental Economics:** Consideration of economic growth without environmental degradation is demanding specialists all over the world. The program of Environmental Economics is introduced to generate skilled personnel in that area by providing learners with rigorous and specialised training.

The program is developed with an introduction to theories of micro- and macro-economics along with mathematical and statistical techniques in the first two semesters. Application of such insights in dynamic contexts would constitute subsequent themes to be covered in the third and fourth semesters. The learner specializes from a range of optional papers consisting of applied econometrics, games and information, ecological economics, trade and environment and economics of global climate change.

All three M.Sc. Programs provide a valuable opportunity for the students to equip their computation skills by learning econometric applications using softwares such as EVIEWS and STATA; undertake a dissertation in the second year to encourage active learning in a real life situation and develop skills for independent analysis.

Examination System

All courses will follow a credit system of examinations with 50 per cent weight for the internal assessments and 50 per cent weight for the end-semester exams. Each semester consists of two internal assessments (each with 25 per cent weight). The grading system is based on norms adopted by IGNOU in respect of Master Degree programs and are commensurate with the system of Indian Universities.

Infrastructure, Computational and Library Facilities

Campuses of IGNOU, New Delhi and MSE, Chennai have their Administrative and Academic Blocks, Library Buildings and teaching facilities. The professional staff in each are provided with modern facilities including access to Internet and internal connectivity

through LAN (Local Area Network). There are provisions of access to online databases, statistical software, journals and other essential services. For further details on IGNOU, visit website: www.ignou.ac.in and on MSE, visit website: www.mse.ac.in

Eligibility

Graduates in any subject with strong Mathematical/Statistical Background (having at least plus 2 level mathematics) are eligible to apply for the programs.

Basis of Selection

Admission will be based on common entrance test and interview at designated centres in India.

Fees

Tuition fee per semester is Rs. 19000. Other charges will be as per rules of respective institutions, viz., IGNOU and MSE.

Application Form

The application form along with program brochure can be downloaded from www.ignou.ac.in and www.mse.ac.in. The filled-in application forms along with a demand draft for Rs. 550 drawn in favour of IGNOU payable at New Delhi should reach the Director, SOSS, IGNOU, Maidan Garhi, New Delhi-110068 on or before 30th June 2011.

Syllabus for Entrance Test

The entrance test will contain two parts. Part-1 is compulsory for all candidates. Part-2 contains two sections and the candidates can choose one. The syllabus for Part-1 includes questions on Plus 2 level mathematics. The options for Part-2 include graduate level mathematics and graduate level economics. The syllabus for mathematics option includes linear algebra, limits and derivatives, unconstrained and constrained optimization, integration, and basic statistics.

The syllabus for economics option includes micro- and macro-economics and Indian economy. The candidates have to answer 100 multiple choice questions – 50 from part one and 50 from part two. Maximum marks are 100 and maximum allowed time is 90 minutes.

Important Dates

June 30, 2011 : Last date for receipt of application

July 19, 2011 : Date of Entrance Test

July 25, 2011 : Results of Entrance Test

July 29-31, 2011 : Counseling and Admission

August 1, 2011: Semester Starts

Application No.:

(to be filled by office)



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**Indira Gandhi National Open University,
New Delhi & Madras School of Economics,
Chennai**

APPLICATION FORM FOR ADMISSION INTO TWO-YEAR POST-GRADUATE PROGRAMS IN ACTUARIAL ECONOMICS, APPLIED QUANTITATIVE FINANCE AND ENVIRONMENTAL ECONOMICS LEADING TO M.Sc. DEGREES

(Note: Please fill in each column in your own handwriting, put (√) wherever necessary and strike off the portion not applicable. The filled in application should reach on or before 30th June 2011 to

The Director, SOSS, IGNOU, Maidan Garhi, New Delhi- 110068

Select the program for which you want to apply. If you are applying for more than one program, indicate your preference (highest preference is indicated by 1)

M.Sc. in Actuarial Economics
M.Sc. in Applied Quantitative Finance
M.Sc. in Environmental Economics

Preference (1, 2, 3)

Select the Campus for 2-year PG Program:

MSE, Chennai

IGNOU, New Delhi

1. a) **Full Name of the Candidate** :
(IN BLOCK LETTERS)
- b) **Address for communication** : -----

- c) **Contact number(s)**
Fixed-line :
Mobile :
- d) **Email Address** :
2. **Parent/Guardian’s Name & Occupation** :
3. **Sex** : **Male** **Female**
4. **Date of Birth (attach proof)** :
5. **Community (State whether OBC/SC/ST; attach proof)** :
6. **Annual Income of the Family** :
7. **Qualifying Examination Passed**^{*} :
(Attested photocopy of both Degree Certificate & Statement of marks of all Examinations during UG course to be enclosed)
- * state “Awaiting final results” if final semester/year results are not announced*
9. **Name of the College/University where : studied for UG course and Year of Passing**
9. **Percentage of Marks Obtained in UG : Overall** :
Quantitative Papers# :
- # Maths, Statistics and other quantitative papers together*

10. Percentage of Marks obtained in Plus 2: Overall :

Mathematics :

(Attested photocopy of plus two mark sheet to be enclosed)

11. DD Number----- Amount ----- Date-----

SELECT THE CENTRE FOR ENTRANCE TEST (TENTATIVE):

Preference (1, 2, 3,4)

NEW DELHI

CHENNEI

KOLKATA

MUMBAI

Declaration by the Candidate:

I declare that the information furnished by me herein is true and correct.

Signature of the Candidate

Place:

Date:

Application No.:

(to be filled by the office)



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**Indira Gandhi National Open University, New
Delhi & Madras School of Economics, Chennai**

(To be filled by the office)

Hall Ticket for the Entrance Test

(To be shown by the candidate at the time of the entrance test)

Hall Ticket Number: _____

Date of Entrance Test: _____

Entrance Test Centre: _____

Authorized Signatory

Syllabus for the Entrance Test

The entrance test will contain two parts. Part One is compulsory for all candidates. Part Two contains two sections and the candidates can choose one. The syllabus for Part One includes questions on Plus 2 level mathematics. The options for Part Two include graduate level mathematics and graduate level economics. The syllabus for mathematics option include linear algebra, limits and derivatives, unconstrained and constrained optimization, integration, and basic statistics. The syllabus for economics option include micro- and macro-economics and Indian economy.

Structure of the Entrance Test

- **Part I is compulsory and Choose one Section (A - Economics or B - Mathematics) from Part II.**
- **Total questions to be answered are 120.**
- **Each question will carry one mark (and no negative mark for wrong answer).**
- **Total (Maximum) Marks: 120.**
- **Total Allowed Time: 120 minutes**
- **Use of devices like calculators, tables and pagers, mobile phones is not allowed for this examination.**

Sample Questions for the Entrance Test

PART I

1. What is probability of having three girls in a family of three children?
(a) 0.125 (b) 0.500 (c) 0.250 (d) 1.000
2. A matrix whose elements are second order partial derivatives is called:
(a) Jacobian matrix (b) Singular matrix (c) Hessian matrix (d) Orthogonal matrix
3. A matrix is said to be singular if its determinant is:
(a) 1 (b) 2 (c) negative (d) zero
4. The Poisson distribution is:
(a) continuous (b) decreasing (c) straight line (d) discrete
5. A distribution has zero skewness if it is:
(a) symmetrical about its mode (b) symmetrical about its mean
(c) symmetrical about its median (d) symmetrical about its variance
6. The characteristic roots of the matrix $\begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix}$ are:
(a) (2,2) (b) (2,0) (c) (0,2) (d) (1,1)
7. Let $X \sim N(\mu, \sigma)$. Its corresponding standard normal distribution is:
(a) $Z = (X - \sigma)/\mu$ (b) $Z = (X - \mu)/\sigma$ (c) $Z = (X - \sigma)/\mu^2$ (d) $Z = (X - \mu)/\sigma^2$
8. $\lim_{x \rightarrow 5} (3x^3 + 5x^2 - 2x + 3)$ equals:
(a) 439 (b) 493 (c) 394 (d) 934

9. If X and Y are independent, $V(X+Y)$ equals:
 (a) $V(X)+V(Y)$ (b) $V(X)+V(Y)+2COV(X,Y)$ (c) $V(X)+V(Y)-2COV(X,Y)$ (d) $V(X) - V(Y)$
10. Given that $q = Ap^\alpha$, where q -quantity demanded and p - price and A and α are constants. The (price) elasticity, η is:
 (a) $\alpha Ap^{\alpha-1}$ (b) $Ap^{\alpha-1}$ (c) α (d) Ap^α

PART II
(SECTION A – ECONOMICS)

1. The relationship between the inputs used in production and the level of output is captured by the:
 (a) production function (b) production possibilities curve
 (c) average cost curve (d) long-run average fixed cost curve
2. When a firm changes the amount of an input it uses and output changes more than proportionately, the production function is said to exhibit
 (a) increasing production possibilities (b) constant returns
 (c) decreasing opportunity costs (d) increasing returns
3. Which of the following is most likely to be a fixed cost?
 (a) electricity payments (b) property taxes (c) office supplies (d) wage payments
4. When a firm reduces one input by a unit and then raises another input enough so that final output remains the same, the amount of extra input required is called the
 (a) marginal rate of technical substitution (b) marginal rate of economies of scale
 (c) marginal rate of diminishing returns (d) rate of increased returns
5. Suppose that a firm's total revenue equals Rs. 80,000. Labor costs are Rs. 40,000, materials cost Rs. 20,000 and the owner could have earned Rs. 15,000 outside. To an economist, profit would equal
 (a) Rs. 55,000 (b) Rs. 5,000 (c) Rs. 20,000 (d) Rs. 40,000
6. The more elastic is the supply of a product, the:
 (a) smaller will be the change in price for a given increase in demand
 (b) larger will be the change in price for a given increase in demand
 (c) larger will be the shift in the supply curve for a given change in price
 (d) smaller will be the change in quantity for a given change in price
7. The price elasticity of demand is defined as the responsiveness of
 (a) Price to a change in quantity demanded (b) Quantity demanded to a change in price
 (c) Price to a change in income (d) Quantity demanded to a change in income
8. Suppose a consumer's income increases from Rs. 30,000 to Rs. 36,000. As a result, the consumer increases her purchases of compact discs (CDs) from 25 CDs to 30 CDs. What is the consumer's income elasticity of demand for CDs?
 (a) 0.5 (b) 1.0 (c) 1.5 (d) 2.0
9. Indifference curves that are convex to the origin reflect:
 (a) an increasing marginal rate of substitution
 (b) a decreasing marginal rate of substitution
 (c) a constant marginal rate of substitution
 (d) a marginal rate of substitution that first decreases, then increases
10. Ram divided his purchases between soft drink and dosas. Suppose Ram's budget constraint is graphed with soft drink on the horizontal axis and dosas on the vertical axis. If the price of soft drink is Rs. 1.50 per unit, the price of dosas is Rs. 2.00 per unit, and Ram's income is Rs. 30 per week, then the budget constraint has a slope equal to:
 (a) -1.33 (b) -2 (c) -0.75 (d) -1.5

PART II
(SECTION B – MATHEMATICS)

1. A function whose derivative is a constant multiple of itself must be:
 (a) Quadratic (b) linear (c) logarithmic (d) exponential
2. If $f(x) = (1+2x)^5$, then the fourth derivative of $f(x)$ is:
 (a) $5 \cdot 2^5$ (b) 0 (c) $5! (2)$ (d) $5! (1+2x)$
3. Which of the following statements about the function given by $f(x) = x^4 - 2x^3$ is true?
 (a) The function has no relative extremum
 (b) The graph of the function has one point of inflection and the function has two relative extrema
 (c) The graph of the function has two points of inflection and the function has one relative extremum
 (d) The graph of the function has two points of inflection and the function has two relative extrema
4. If $f(x) = 2 + |x-4|$, then $f'(4) =$
 (a) 2 (b) 1 (c) -1 (d) Non-existent
5. If $f(x) = \frac{x^2 - 9}{x + 3}$ is continuous at $x = -3$, then $f(-3) =$
 (a) -3 (b) 3 (c) -6 (d) 0
6. Let $F(x) = \int_0^x e^{-t^2} dt$, then $F'(1)$ equals:
 (a) e (b) $1/e$ (c) 1 (d) $1/\log x$
7. Let $A = \begin{bmatrix} 1 & -3 & -4 \\ 2 & 1 & 0 \\ 3 & -2 & 5 \end{bmatrix}$. Which of the following is true?
 (a) $\det(A) = 3$ (b) $\det(A) = 63$ (c) $\det(A) = 7$ (d) $\det(A)$ is undefined
8. Which of the following formulas is false (x, y , and z are positive)?
 (a) $\ln x^5 - \ln x^3 = 2 \ln x$ (b) $2 \ln \frac{x}{y} + \ln \frac{y^2}{x^2} = 0$
 (c) $\ln[(x+y)^{1/5} z^{2/3}]^{1/5} = 3 \ln(x+y) + 10 \ln z$ (d) $(\ln x)^4 = 4 \ln x$
9. Which of the following polynomials leaves a remainder when divided by $x+2$?
 (a) $r(x) = (x+2)^{1/2}$ (b) $p(x) = x^2 - 4$
 (c) $s(x) = x^4 + 3x^2 + 1$ (d) $q(x) = -x^3 + 8x^2 + 3x - 34$
10. It is given that $P(A \cup B) = 0.6$, $P(A) = 0.3$, $P(A \cap B) = 0.2$, $P(A \cap C) = 0.1$, and $P(C) = 0.4$. Then $P(A|B)$ (upto 3 decimal places) is:
 (a) 0.333 (b) 0.667 (c) 0.400 (d) 0.924