Madras School of Economics
&
Central University of Tamil Nadu

Admission to M.Sc. Programs (2012-13)
in
(i) Actuarial Economics
(ii) Applied Quantitative Finance, and
(iii) Environmental Economics

These programs are offered at Madras School of Economics in collaboration with Central University of Tamil Nadu (CUTN), Thiruvarur.

Programmes

Madras School of Economics (MSE) 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 Central Universtiy of Tamil Nadu (CUTN), Thiruvarur. These programs are designed to develop well trained (i) Actuaries with a strong background in Economics, Finance, and Insurance, (ii) Financial Analysts with strong training in quantitative Economics and Finance, and (iii) Environmental Economists with training in applied quantitative techniques for addressing environmental issues. The successful candidates will cater to the growing demand for actuaries, financial analysts/analytics, and environmental managers in the fast growing insurance, health, financial services, and national/multi-lateral environmental agencies.

Background

(i) M.Sc. Actuarial Economics: The Insurance sector in India is growing at a fast rate. Qualified Actuaries are in high demand as there is considerable shortage of trained Actuaries in India. A well qualified Actuary has to be an expert in 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. The M.Sc Actuarial Economics program offered jointly by CUTN and MSE is designed keeping in mind the courses and syllabi prescribed by the Actuarial Society of India.

Being designed to equip the learners with the underlying processes of decision making under uncertainty, this program seeks to offer in the first year, comprising two semesters, an intensive training in understanding economic and financial theories, which are useful

to study the uncertain future events. The third and the fourth semesters provide the opportunity to opt for electives from the number of choices including applied econometrics, advanced techniques in finance, environment and health.

(ii) M.Sc. Applied Quantitative Finance: There has been an exponential increase in the demand for qualified financial analysts. Qualified financial analysts should have the ability to adequately capture stylized facts in financial markets through effective models, and the ability to estimate and evaluate the models. The M.Sc. Applied Quantitative Finance aims to develop such skilled financial analysts. The progam is geared towards presenting the central concepts in clear, analytical, mathematical and computational detail with an emphasis on the underlying intuition. In addition, Business Case Studies would be provided wherever it is necessary.

The program emphasizes independent research. Students are required to do term papers in most of the courses. Interested students take up a summer internship program at the end of the first year, which greatly helps them to get an orientation in applied work. The elective courses include applied econometrics, stochastic models, advanced techniques in finance, financial instruments and markets, and artificial neural networks.

(iii) M.Sc. Environmental Economics: Concerns about over-exploitation of resources and degradation of environment have been on rise in India and other countries over the past fifty years. High economic growth often comes at the cost of environmental degradation as seen in several countries and hence careful attention to sound environmental policies is extremely important if India were follow sustainable development path. Businesses world over have also started understanding the importance of doing 'green' business. The objective of the M.Sc. Environmental Economics is to provide students with rigorous and specialised training in economics of the environment.

Almost all courses are analytical in nature involving application of mathematical, statistical, and econometric analyses. The elective courses include 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 enhance their computation skills by learning econometric applications using soft wares such as EVIEWS and STATA; and the students undertake a dissertation in the second year to encourage active learning in a real life situation.

Examination System

All courses will follow the evaluation rules as per M.A./M.Sc. rules and regulations of CUTN. That is, all courses will have both internal and end-semester evaluations.

About Madras School of Economics

Madras School of Economics has been offering 2-Year M.Sc programs in (i) General Economics, and (ii) Financial Economics from last academic year 2011-12 in collaboration with the Central University of Tamil Nadu (CUTN), Thiruvarur. It offers additional three M.Sc programs in (i) Actuarial Economics, (ii) Applied Quantitative Finance, and (iii) Environmental Economics in collaboration with CUTN from this academic year 2012-13. These three programs were earlier offered in collaboration with IGNOU, New Delhi and other two programs (M.Sc General Economics and M.sc Financial Economics) were earlier offered with Anna University, Chennai. From this academic year onwards, all the five M.Sc programs are offered in collaboration with CUTN. The M.Sc courses are recognized as advanced courses by the academic circle and the market. Campus recruitment takes place in the second year by various leading businesses and other institutions. The main organizations that participated in the campus recruitment for the current batch include CITI, TARGET, FORD, HP, TCS, IBM, TOWERS WATSON, VENTURE INTELLEGENCE, LUCID, IFMR CIRM, REDWOOD, 24[7], INDIAN BANK, BUSINESS LINE, TICKER PLANT, and WNS.

MSE has highly qualified faculty, a well endowed library and a computer centre. MSE subscribes to Econlit and Sciencedirect and has access to more than seven hundred international journals in economics, finance, insurance and environment. For further details, please visit the MSE website at www.mse.ac.in.

Number of Seats

For each program, the number of intake is 30. The total seats for three programs are 90.

Eligibility

Any graduate of a recognized University with a minimum of 55% marks (50 % for SC/ST/PH) in aggregate with Economics / Statistics/ Mathematics as one of the subjects (papers) is eligible to apply for the programs.

Application and Basis of Selection

Admission will be based on common entrance test at designated centres in India and counseling at MSE. Reservation of seats will be as per the Government of India norms. The application form along with program brochure can be downloaded from www.mse.ac.in. The filled-up applications along with appropriate DD drawn in favour of "Madras School of Economics" payable at Chennai should be sent to The Director, Madras School of Economics, Gandhi Mandapam Road, Chennai 600 025 on or before 20th June 2012.

Fees

The fees per semester for M.Sc. Actuarial Economics, M.Sc Applied Quantitative Finance and M.Sc. Environmental Economics are Rs. 22,100. Other charges will be as per MSE rules.

Hostel Facility

Madras School of Economics offers hostel facility to outstation candidates (separately for boys and girls), subject to availability. Those who need hostel accommodation at MSE should send separate application to The Administrative Officer, MSE, Gandhi Mandapam Road, Chennai – 600 025.

Important Dates

June 20, 2012: Last date for receipt of application
June 29, 2012: Date of Entrance Examination
July 3, 2012: Results
July 7, 2012: Counseling and Admission
July Second Week Semester Starts

ENTRANCE EXAMINATION (2012-13)

CUTN – MSE

29th June 2012

The Entrance Examination will have 100 questions to be completed in 120 minutes. There are two parts – Part A and Part B.

PART A (35 questions)

This part contains multiple choice questions on language, analytical skills and general aptitude.

PART B (65 questions)

Part B contains four sections covering simple mathematics, statistics, advanced mathematics and economics. While the first three sections contain 15 questions each, the last section on economics will contain 20 questions. All questions carry equal marks and there are no negative markings.

The syllabus for the four sections is as follows:

<u>Mathematics</u> – Plus 2 level Mathematics covering functions, linear Algebra, Limits, differential and integral calculus.

<u>Statistics</u> – Basic statistics of Plus 2 level covering measures of central tendency, probability distribution – normal etc.

<u>Advanced Mathematics</u> – Graduate level mathematics covering linear algebra, limits and derivatives, optimization, integration etc.

<u>Economics</u> – Graduate level economics covering topics in micro- and macro-economics and Indian economic development.

<u>Mathematics – Sample Questions</u>

1.	Find the third order derivative of $Y = 5X^3$: ☐ (a) 30 ☐ (b) $15X^2$ ☐ (c) $30X$ ☐ (d) $5X^2$
2.	$A=\begin{bmatrix} 0 & 0 & 0 \\ 1 & 2 & 3 \\ 2 & 3 & 4 \end{bmatrix}$ $B=\begin{bmatrix} 1 & -2 \\ -1 & 0 \\ 2 & 1 \end{bmatrix}$ Find AB ☐ (a) $\begin{bmatrix} 0 & 0 \\ 5 & 1 \\ 7 & 0 \end{bmatrix}$ ☐ (b) $\begin{bmatrix} 1 & -2 \\ 3 & -5 \\ 4 & 9 \end{bmatrix}$ ☐ (c) $\begin{bmatrix} 3 & -2 \\ 6 & -5 \\ 5 & -7 \end{bmatrix}$ ☐ (d) $\begin{bmatrix} 2 & -2 \\ 5 & 3 \\ 7 & 4 \end{bmatrix}$
3.	$\lim_{x \to 5}(3x^3 + 5x^2 - 2x + 3)$ equals: ☐ (a) 439 ☐ (b) 493 ☐ (c) 394 ☐ (d) 934

4.	If $A = \begin{pmatrix} 2 & 3 & 1 \\ 3 & 4 & 1 \\ 3 & 7 & 2 \end{pmatrix}$ then $A^{-1}A$ is
	☐ (a) 0 ☐ (b) A ☐ (c) I ☐ (d) A^2
5.	The point in the interval (3, 5] is
	☐ (a) 3 ☐ (b) 5.3 ☐ (c) 0 ☐ (d) 4.35

Statistics – Sample Questions

6.	Probability of sure event is
	☐ (a) 1 ☐ (b) 0 ☐ (c) -1 ☐ (d) S
7.	A single letter is selected at random from the word PROBABILITY The probability that it is not a vowel is
	☐ (a) 3/11 ☐ (b) 2/11 ☐ (c) 4/11 ☐ (d) 0
8.	If A and B are independent event, then P(A ∩ B) is
	☐ (a) P(A) P(B) ☐ (b) P(A) + P(B) ☐ (c) P(A/B) ☐ (d) P(B) - P(A)
9.	Which expression gives the probability $P\left(\dfrac{1}{2} < X < 1\right)$ using $F(x)$, given 0<x<1
	☐ (a) $P\left(\dfrac{1}{2} < X < 1\right) = F\left(\dfrac{1}{2}\right) - F(1)$ ☐ (b) $P\left(\dfrac{1}{2} < X < 1\right) = F(1) - F\left(\dfrac{1}{2}\right)$
	☐ (c) $P\left(\dfrac{1}{2} < X < 1\right) = F(1) + F(\dfrac{1}{2})$ ☐ (d) $P\left(\dfrac{1}{2} < X < 1\right) = F(1) - F(0)$
10.	If a constant value 4 is subtracted from each observation of a set, the value of the variance is
	☐ (a) reduced by 4 ☐ (b) reduced by 16 ☐ (c) reduced by 2 ☐ (d) unaltered

Advanced Mathematics – Sample Questions

11.	Let $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 0 & -1 \\ 3 & 4 & 5 \end{bmatrix}$. Which of the following is true?
	☐ (a) A is invertible since det(A) = 0 ☐ (b) A is not invertible since det(A) = 0
	☐ (c) A is invertible since det(A) ≠ 0 ☐ (d) A is not invertible since det(A) ≠ 0
12.	Which of the following polynomials leaves a reminder when divided by x+2?
	☐ (a) $r(x) = (x+2)^{12}$ ☐ (d) $p(x) = x^2 - 4$ ☐ (c) $s(x) = x^4 + 3x^2 + 1$ ☐ (d) $q(x) = -x^3 + 8x^2 + 3x - 34$

13.	The characteristic roots of the matrix $A = \begin{pmatrix} 6 & 6 \\ 6 & -3 \end{pmatrix}$ are:
	☐ (a) Both positive ☐ (b) Both negative ☐ (c) One positive and one negative ☐ (d) None of the above
14.	The value of $\quad \lim_{x \to \infty} \left(\sqrt{x^2 + 1} - \sqrt{x^2 - 1} \right)$ is ☐ (a) -1 ☐ (b) 1 ☐ (c) 0 ☐ (d) none of these
15.	At compound interest if a certain sum of money doubles in n years then the amount will be four fold in ☐ (a) $2n^2$ years ☐ (b) n^2 years ☐ (c) 4n years ☐ (d) 2n years

Economics – Sample Questions

16.	The classical *Quantity Theory* of *Money* assumes that: ☐ (a) income is constant. ☐ (b) velocity is constant. ☐ (c) prices are constant. ☐ (d) the money supply is constant.
17.	Assume that apples cost Rs.0.50 in 2002 and Re.1 in 2007, whereas oranges cost Re.1 in 2002 and Rs.0.50 in 2007. If 10 apples and 5 oranges were purchased in 2002, and 5 apples and 10 oranges were purchased in 2007, the CPI for 2007, using 2002 as the base year, is: ☐ (a) 0.75. ☐ (b) 0.80 ☐ (c) 1 ☐ (d) 1.25
18.	The aggregate demand curve tells us possible: ☐ (a) combinations of *M* and *Y* for a given value of *P*. ☐ (b) combinations of *M* and *P* for a given value of *Y*. ☐ (c) combinations of *P* and *Y* for a given value of *M*. ☐ (d) results if the Federal Reserve reduces the money supply.
19.	Assume that we have a demand curve of the form $\ln q = a - b \ln p$. Then the elasticity of demand is ☐ (a) Always increasing with p ☐ (b) Decreasing with p ☐ (c) Constant ☐ (d) None of the above.
20.	In the Kinked Demand Curve Model, suppose MC curve shifts upward in the discontinuous range of MR curve. Which one of the following is correct? At equilibrium, ☐ (a) price rises but quantity remains the same ☐ (b) price and quantity both remain the same ☐ (c) quantify rises but price remains the same ☐ (d) price and quantity both rise