



# Madras School of Economics & Central University of Tamil Nadu



## Admission to M.A. Programs (2017-18)

in

- (i) **Actuarial Economics**
- (ii) **Applied Quantitative Finance**
- (iii) **Environmental Economics**
- (iv) **Financial Economics**
- (v) **General Economics**

These programs are offered at the Madras School of Economic, Chennai, 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.A. Programs in (i) General Economics, (ii) Applied Quantitative Finance, (iii) Financial Economics (iv), Actuarial Economics and (v) Environmental Economics offered in collaboration with Central University of Tamil Nadu (CUTN), Thiruvarur. These programs are designed to develop well trained (i) Economists equipped with a wide range of skills and tools for *quantitative* analysis and give better understanding of the basic theory and how it is being played out in real economies; (ii) Financial practitioners with a good foundation in economics, mathematics, statistics and also well trained in the emerging theoretical and empirical tools for a better understanding of the sector (iii) Financial Analysts with strong training in quantitative economics and finance, (iv) Actuaries with a strong background in economics, insurance, finance, and actuarial mathematics, (v) Environmental Economists with training in applied quantitative techniques for addressing environmental issues. The successful candidates will cater to the growing demand for actuaries, financial practitioners, environmental managers, financial analysts/analytics, and economists in the fast growing insurance, health, national/multi-lateral environmental agencies, and financial services.

### Background

M.A. 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.A. Actuarial Economics program offered jointly by CUTN and MSE is designed keeping in mind the courses and syllabi prescribed by the Institute of Actuaries of India. The elective courses include: applied econometrics, advanced techniques in finance, health economics, stochastic models, and survival models.

M.A. 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.A. Applied Quantitative Finance aims to develop such skilled financial analysts. The program 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 elective courses include applied econometrics, stochastic models, advanced techniques in finance, financial instruments and markets, and artificial neural networks.

M.A. 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.A. Environmental Economics is to provide students with rigorous and specialized training in economics of the environment. The elective courses include: applied econometrics, social cost benefit analysis, energy economics, trade and environment and global climate change.

M.A. Financial Economics: The core courses lay the foundations for the basic theory and give students a feel for how it is being played out in real economies. The courses in Statistics, Mathematical Methods, Econometrics and Applied Econometrics equip them with a good range of skills and tools for quantitative analysis. In addition, a range of one-semester elective courses to choose from are offered in the following specialized subjects- Risk Management, Investment Banking, Financial Regulation and Banking Supervision, Games and Information, Stochastic Models, Economics of Insurance, Empirical Methods in Finance.

M.A. General Economics: The core courses lay the foundations for the basic theory and give students a feel for how it is being played out in real economies. The courses in Statistics, Optimization Techniques, Econometrics and Applied Econometrics equip them with a good range of skills and tools for quantitative analysis. The compulsory course in Fiscal and Public Policy provides a unique opportunity to understand the policy prescriptions for a developing country like India. In addition, depending on the demand, courses on subfields like Development Economics,

Financial Economics, Health Economics, Games and Information, Industrial Economics, Agricultural Economics, Indian Economic Development, International Trade and so on are offered as electives.

All five M.A. 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. Almost all courses are analytical in nature involving application of mathematical, statistical, and econometric analyses. All the five programs emphasize independent research. Under a Choice Based Elective scheme, students in the second year have options to take courses offered in any of the other streams of study, beyond the one which they will receive the degree in, subject to availability of seats and their completion of any pre-requisites. 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 students have an option to 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. rules and regulations of CUTN. That is, all courses will have both internal and end-semester evaluations.

### **Five year Integrated Master's Programme in Economics**

A five-year integrated Master's programme in Economics in collaboration with CUTN is offered from the academic year 2015-16. In the first three years, students are trained at CUTN, Thiruvavur and for the remaining two years students study at MSE. Students can opt for an exit option after three years along with an undergraduate degree (BA-Honors) after successful completion of the courses and examination requirements for the first three years. The students who want to continue with the five-year program would have a choice of pursuing their Masters program at CUTN or at MSE. If they choose to be at MSE then they have a choice between any one of the five post-graduate courses taught at MSE for their specialization.

#### **Seat Distribution:**

Based on the number of students from IMSc the number of seats per stream is calculated as below:

**Seats per stream = Total number of students / number of streams.**

The degree will be awarded by the CUTN to students who successfully complete the approved teaching program in economics including the integrated program and two-year post graduate programs at MSE.

## **About Madras School of Economics**

Madras School of Economics has been offering 2-Year M.A. programs in (i) General Economics, (ii) Financial Economics, (iii) Actuarial Economics, (iv) Applied Quantitative Finance and (v) Environmental Economics and 5-year Integrated M.A. program in Economics in collaboration with the Central University of Tamil Nadu. Earlier it offered M.A. Economics and M.A. Financial Economics in collaboration with Anna University and other three Masters programs with Indira Gandhi National Open University. All these M.A. 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 Absolut Data, Accenture, Bridge-i2i, CitiBank, Ernst & Young, Ford, HCL, HDFC, HSBC, IBM, IGATE, InRhythm, J.P Morgan, Latent View, MuSigma, RBS, Royal Sundaram, Scienaptic, Smart Cube, Target, TCS, TVS, Dunhumby, IBM, TATA CAD, Deloitte, Crisil, Cognizant

The offered salary ranges between Rs. 4.5 lakh to Rs.12 lakh.

MSE has highly qualified faculty, a well endowed library and a computer centre. MSE subscribes to Science Direct, Jstor, Ebsco-Econlit (full text), Indiastat.com, - CMIE-Prowess, Economist, EPW 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](http://www.mse.ac.in).

## **Number of Seats**

**For M.A. Actuarial Economics and M.A. Environmental Economics the number of intake is 30 each. For the other three programs, the number of intake is 50 each. The total seats for five programs are 210.**

## **Eligibility**

Any graduate of a recognized University with a minimum of 55% marks for general category, 50% marks for OBC (Non-creamy Layer), 45% marks for SC/ST/PWD Candidates and had studied Mathematics at plus two level.

## **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.cutn.ac.in](http://www.cutn.ac.in); <https://cucet2017.co.in/WebPages/StaticPages/Home.aspx>

## **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.**

<b>S.No</b>	<b>Description</b>	<b>Date</b>
1.	Opening of online Application Form for all programs	20-March-17
2.	Closing of online Application Form for all programs	14-April-17
3.	Issue of Admit Cards	5-May-17
4.	Exam Dates	17-18 -May-17
5.	Answer Key upload	19- May-17
6.	Grievances, if any, upto	05.00p.m. on 22-May-17
7.	Corrected answer key ready	29-May-17
8.	Result Declaration	7-June-17

**For payment through online/debit/credit card no extra charges are to be paid by the candidates**

**The bank will not accept any fees after 14th April 2017.**

**ENTRANCE EXAMINATION\_MODEL**

**CUTN – MSE**

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:

**Mathematics** – Plus 2 level Mathematics covering functions, linear Algebra, Limits, differential and integral calculus.

**Statistics** – Basic statistics of Plus 2 level covering measures of central tendency, probability distribution – normal etc.

**Advanced Mathematics** – Graduate level mathematics covering linear algebra, limits and derivatives, optimization, integration etc.

**Economics** – Graduate level economics covering topics in micro- and macro-economics and Indian economic development.

**Mathematics – Sample Questions**

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

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

**Statistics - Sample Questions**

6.	Probability of sure event is <input type="checkbox"/> (a) 1 <input type="checkbox"/> (b) 0 <input type="checkbox"/> (c) -1 <input type="checkbox"/> (d) S
7.	A single letter is selected at random from the word PROBABILITY The probability that it is not a vowel is <input type="checkbox"/> (a) 3/11 <input type="checkbox"/> (b) 2/11 <input type="checkbox"/> (c) 4/11 <input type="checkbox"/> (d) 0
8.	If A and B are independent event, then $P(A \cap B)$ is <input type="checkbox"/> (a) $P(A) P(B)$ <input type="checkbox"/> (b) $P(A) + P(B)$ <input type="checkbox"/> (c) $P(A/B)$ <input type="checkbox"/> (d) $P(B) - P(A)$
9.	Which expression gives the probability $P\left(\frac{1}{2} < X < 1\right)$ using $F(x)$ , given $0 < x < 1$ <input type="checkbox"/> (a) $P\left(\frac{1}{2} < X < 1\right) = F\left(\frac{1}{2}\right) - F(1)$ <input type="checkbox"/> (b) $P\left(\frac{1}{2} < X < 1\right) = F(1) - F\left(\frac{1}{2}\right)$ <input type="checkbox"/> (c) $P\left(\frac{1}{2} < X < 1\right) = F(1) + F\left(\frac{1}{2}\right)$ <input type="checkbox"/> (d) $P\left(\frac{1}{2} < X < 1\right) = F(1) - F(0)$
10.	If a constant value 4 is subtracted from each observation of a set, the value of the variance is <input type="checkbox"/> (a) reduced by 4 <input type="checkbox"/> (b) reduced by 16 <input type="checkbox"/> (c) reduced by 2 <input type="checkbox"/> (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? <input type="checkbox"/> (a) A is invertible since $\det(A) = 0$ <input type="checkbox"/> (b) A is not invertible since $\det(A) = 0$ <input type="checkbox"/> (c) A is invertible since $\det(A) \neq 0$ <input type="checkbox"/> (d) A is not invertible since $\det(A) \neq 0$
12.	Which of the following polynomials leaves a remainder when divided by $x+2$ ? <input type="checkbox"/> (a) $r(x) = (x+2)^{12}$ <input type="checkbox"/> (d) $p(x) = x^2 - 4$ <input type="checkbox"/> (c) $s(x) = x^4 + 3x^2 + 1$ <input type="checkbox"/> (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: <input type="checkbox"/> (a) Both positive <input type="checkbox"/> (b) Both negative <input type="checkbox"/> (c) One positive and one negative <input type="checkbox"/> (d) None of the above
14.	The value of $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 1} - \sqrt{x^2 - 1})$ is <input type="checkbox"/> (a) -1 <input type="checkbox"/> (b) 1 <input type="checkbox"/> (c) 0 <input type="checkbox"/> (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 <input type="checkbox"/> (a) $2n^2$ years <input type="checkbox"/> (b) $n^2$ years <input type="checkbox"/> (c) $4n$ years <input type="checkbox"/> (d) $2n$ years

### **Economics - Sample Questions**

16.	The classical <i>Quantity Theory of Money</i> assumes that: <input type="checkbox"/> (a) income is constant. <input type="checkbox"/> (b) velocity is constant. <input type="checkbox"/> (c) prices are constant. <input type="checkbox"/> (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: <input type="checkbox"/> (a) 0.75. <input type="checkbox"/> (b) 0.80 <input type="checkbox"/> (c) 1 <input type="checkbox"/> (d) 1.25
18.	The aggregate demand curve tells us possible: <input type="checkbox"/> (a) combinations of $M$ and $Y$ for a given value of $P$ . <input type="checkbox"/> (b) combinations of $M$ and $P$ for a given value of $Y$ . <input type="checkbox"/> (c) combinations of $P$ and $Y$ for a given value of $M$ . <input type="checkbox"/> (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 <input type="checkbox"/> (a) Always increasing with $p$ <input type="checkbox"/> (b) Decreasing with $p$ <input type="checkbox"/> (c) Constant <input type="checkbox"/> (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, <input type="checkbox"/> (a) price rises but quantity remains the same <input type="checkbox"/> (b) price and quantity both remain the same <input type="checkbox"/> (c) quantity rises but price remains the same <input type="checkbox"/> (d) price and quantity both rise