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 Institute of Actuaries of India. The elective courses include: applied econometrics, advanced techniques in finance, health economics, stochastic models, and survival models.
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 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.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 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.Sc. 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.Sc. 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.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. Almost all courses are analytical in nature involving application of mathematical, statistical, and econometric analyses. All the five programs emphasize 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 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.

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, Thiruvarur 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 an option of choosing any one of the five post-graduate courses being taught at MSE for their specialization at the Master’s level.

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 any 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.Sc programs in (i) General Economics, (ii) Financial Economics, (iii) Actuarial Economics, (iv) Applied Quantitative Finance and (v) Environmental Economics and 5-year Integrated M.Sc program in Economics in collaboration with the Central University of Tamil Nadu. Earlier it offered M.Sc Economics and M.Sc Financial Economics in collaboration with Anna University and other three Masters programs with Indira Gandhi National Open University. All these 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 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.

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, 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 M.Sc. Actuarial Economics and M.Sc. 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 (50% for OBC - Non Creamy Layer; and 45% for SC/ST candidates) and Mathematics at plus two level.

Age Limit
24 years i.e."The candidates should not have completed 24 years as on 01-07-2015".

Application and Basis of Selection
Admission will be based on COMMON ENTRANCE TEST (CUCET, 2015) at designated centres in India and counseling(with an additional admission test to test the subject knowledge of the candidate) 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 and www.cutn.ac.in, http://www.cucet2015.co.in/

Fees

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:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description</th>
<th>Activity Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Online Application Form Go-Live date</td>
<td>06-Apr-15</td>
</tr>
<tr>
<td>2.</td>
<td>Closing date of online applications</td>
<td>05-May-15</td>
</tr>
<tr>
<td>3.</td>
<td>Admit cards upload date</td>
<td>21-May-15</td>
</tr>
<tr>
<td>4.</td>
<td>Exam Dates</td>
<td>06-07-June-15</td>
</tr>
<tr>
<td>5.</td>
<td>Score Report to be uploaded on CUCET 2015 website</td>
<td>18-June-15</td>
</tr>
</tbody>
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* All challans generated upto 1800 hrs. on 5th May 2015 can be paid upto 7th May 2015. The bank will not accept any fees after this date.
SYLLABUS FOR ENTRANCE EXAMINATION CUCET (2015-16)
There will be only one test paper for this session. It will be MBA admission Test type paper. The question paper will comprise of 100 MCQs from the following discipline. i.e. English, Numerical Aptitude/Data Interpretation, Analytical Skills, Reasoning, General Aptitude, General Knowledge.

SYLLABUS FOR ADDITIONAL ADMISSION TEST (2015) AT MSE

At the time of counseling the meritorious students selected based on their performances in the CUCET, 2015 will be called for an additional test at MSE campus (of 1 hour duration) for final selection. 50% weightage each to the CUCET, 2015 common entrance test and additional selection test will be given. The additional entrance test will have 50 questions (multiple choice type and each will carry equal marks and there are no negative marks) from mathematics, statistics and economics.

ADDITIONAL ENTRANCE EXAMINATION (2015-16)

Syllabus

1. **Statistics** – Basic statistics of Plus 2 level covering measures of central tendency, probability distribution – normal etc.
2. **Mathematics** – Graduate level mathematics covering linear algebra, limits and derivatives, optimization, integration etc.
3. **Economics** – Graduate level economics covering topics in micro- and macro-economics and Indian economic development.

**Mathematics – Sample Questions**

<table>
<thead>
<tr>
<th></th>
<th>Find the third order derivative of ( Y = 5X^2 ):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>□ (a) 30   □ (b) 15 ( X^2 )   □ (c) 30X   □ (d) 5X^2</td>
</tr>
<tr>
<td>2.</td>
<td>( \begin{bmatrix} 0 &amp; 0 &amp; 0 \ 1 &amp; 2 &amp; 3 \ 2 &amp; 3 &amp; 4 \end{bmatrix} ) ( \begin{bmatrix} 1 \ -1 \ 2 \end{bmatrix} ) Find ( AB )</td>
</tr>
<tr>
<td></td>
<td>□ (a) ( \begin{bmatrix} 0 \ 5 \ 7 \end{bmatrix} ) □ (b) ( \begin{bmatrix} 1 \ 3 \ 4 \end{bmatrix} ) □ (c) ( \begin{bmatrix} 3 \ 6 \ 5 \end{bmatrix} ) □ (d) ( \begin{bmatrix} 2 \ 5 \ 7 \end{bmatrix} )</td>
</tr>
<tr>
<td></td>
<td>( \begin{bmatrix} 1 \ -2 \ 2 \end{bmatrix} ) ( \begin{bmatrix} 3 \ -2 \ 3 \end{bmatrix} ) ( \begin{bmatrix} 2 \ -2 \ 4 \end{bmatrix} ) ( \begin{bmatrix} 2 \ -2 \ 4 \end{bmatrix} )</td>
</tr>
</tbody>
</table>
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

6. Let \( A = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 0 & -1 \\ 3 & 4 & 5 \end{pmatrix} \). 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 \( \det(A) \neq 0 \)
- (d) \( A \) is not invertible since \( \det(A) \neq 0 \)

7. Which of the following polynomials leaves a remainder when divided by \( x + 2 \)?

- (a) \( r(x) = (x+2)^{12} \)
- (b) \( p(x) = x^2 - 4 \)
- (c) \( s(x) = x^4 + 3x^2 + 1 \)
- (d) \( q(x) = -x^3 + 8x^2 + 3x - 34 \)

8. 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

9. The value of \( \lim_{x \to \infty} \left( \frac{x^2 + 1}{\sqrt{x^2 - 1}} \right) \) is

- (a) -1
- (b) 1
- (c) 0
- (d) none of these

10. 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) 4\( n \) years
- (d) 2\( n \) years
Statistics – Sample Questions

11. Probability of sure event is
   ☐ (a) 1 ☐ (b) 0 ☐ (c) -1 ☐ (d) S

12. 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

13. 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)

14. Which expression gives the probability \( P\left(\frac{1}{2} < X < 1\right) \) using \( F^{-1} \), given 0<x<1
   ☐ (a) \( P\left(\frac{1}{2} < X < 1\right) = F\left(\frac{1}{2}\right) - F\left(\frac{1}{2}\right) \)
   ☐ (b) \( P\left(\frac{1}{2} < X < 1\right) = F\left(\frac{1}{2}\right) - F\left(\frac{1}{2}\right) \)
   ☐ (c) \( P\left(\frac{1}{2} < X < 1\right) = F(1) + F\left(\frac{1}{2}\right) \)
   ☐ (d) \( P\left(\frac{1}{2} < X < 1\right) = F\left(\frac{1}{2}\right) - F\left(\frac{1}{2}\right) \)

15. 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

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:
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) quantity rises but price remains the same
   - (d) price and quantity both rise