



Madras School of Economics (Recognized as *Institute of Special Importance* by the Government of Tamil Nadu)

Admission to M.A. Programs (2021-22) in

Actuarial Economics
Applied Quantitative Finance
Environmental Economics
Financial Economics
General Economics

Offered by the Madras School of Economic, Chennai.

Programs

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. 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 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 masters program in 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 MSE. The Continuous Internal Assessment (CIA) and End Semester Examination (ESE) will form the basis for Evaluating/grading the student performance in each paper/course.

Number of Seats

The intake under each of the five M.A. Programs will be 30, including 35% quota for the resident students of Tamil Nadu.

Eligibility

- a) Undergraduate degree in social sciences (including commerce & management), sciences, or engineering (including those who are appearing for their final year exams in the AY 2021).
- b) The eligible candidates must secure at under-graduation level: 55% for General category; 50% for OBC – Non Creamy Layer; 45% for SC/ST/PWD candidates.
- c) The eligible candidates should not have completed 25 years as on 1st July 2021.
- d) The candidates should have studied mathematics at plus two level, or its equivalent – which includes, pass certificate from National Institute of Open Schooling for mathematics at Senior Secondary level, or completion of mathematical economics course(s) at under-graduate level.

Application and Basis of Selection

Admission will be based on entrance test at designated centres in India, subject to fulfillment of eligibility criteria. In case of tie in entrance test marks, merit ranking will be based on percentage of marks obtained in the qualifying examination, and age.

Candidates can fill the application form online at www.mse.ac.in.

- Application fee: Rs. 1000/- only (General category); Rs. 800/- only (SC/ST category)

Program Fee Structure

- The M.A. Program is a two-year full-time program comprising of four semesters. The total fees per semester constitute Rs. 1.00 lakh as semester fee, and Rs. 30,000 towards infrastructure development.
- In addition, the students must pay one-time admission fee of Rs. 5000.
- Students belonging to the SC and ST social groups can avail 20% concession in the semester fees.

Program Fee Refund Policy

- For students withdrawing from the Program before the commencement of 1st semester classes
 - Deduct admission fee (Rs. 5000), processing fee (Rs. 5000) and refund the rest.
- For students withdrawing from the Program after the commencement of 1st semester classes, but before the closure of the Admission Process
 - Deduct admission fee (Rs. 5000), processing fee (Rs. 5000), 25% of semester fee and refund the rest.
- For students withdrawing from the Program after the closure of the Admission Process
 - Deduct admission fee (Rs. 5000), processing fee (Rs. 5000), 100% of semester fee and refund the rest.

Hostel Facility

Madras School of Economics offers hostel facility to outstation candidates (separately for boys and girls), subject to availability. Due to prevailing pandemic situation, the hostel facility is currently not available.

Important Dates

S.No	Description	Date
1.	Online Application Form - Opening	4 th June 2021
2.	Online Application Form - Closing	30 th June 2021
3.	Issue of Admit Cards (Download)	1 st July 2021
4.	Entrance Test	17 th July 2021
5.	Result Declaration (Score Card Download)	24 th July 2021
6.	Counseling	26 th July to 7 th August 2021
7.	Commencement of Classes	10 th August 2021

About Madras School of Economics

Madras School of Economics (MSE) was established by renowned fiscal expert Padma Vibhushan Dr. Raja Chelliah in 1990s to impart higher education in economics in Southern India and also to develop the School as a think-tank to advise the Central and State Governments on various economic policies. The Madras School of Economics continued to grow under the able guidance of Padma Vibhushan Dr. C. Rangarajan (Former Chairman of Economic Advisory Council to Prime Minister of India and Former Governor of Reserve Bank of India) and other eminent members of the Board of Governors. MSE has emerged as a leading Centre of Excellence of Post Graduate Teaching and Research in Economics, Environment, Finance and Management in country. Over the past two decades MSE has received support for its teaching program from eminent universities such as Anna University, Chennai and the Central University of Tamil Nadu, Thiruvavur. With strong emphasis on quantitative methods, MSE's curriculum is on par with international standards. Further, MSE is rated as one of the top Post Graduate teaching institute in the country. MSE has also collaborated with many government, non-government, and academic agencies for furthering economic policy and research in India.]

In view of MSE's significant contributions to Post Graduate Teaching and Research in Economics, the Government of Tamil Nadu has recognized MSE as a degree granting institute and established **MSE-Institute of Special Importance** in economics and management through the Act of Tamil Nadu Act 25 of 2020.

Until AE 2020-21, 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. 6.5 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.

MADRAS SCHOOL OF ECONOMICS M.A. ENTRANCE TEST – MSEET-2021

Entrance Test Pattern

Number of parts	Two <ul style="list-style-type: none">➤ Part-A (compulsory)➤ Part-B (to choose between Mathematics/Statistics stream and Economics stream)
Total number of questions	Seventy Five <ul style="list-style-type: none">➤ Part-A: 25➤ Part-B: 50
Test duration	120 minutes (2 hours)
Coverage of topics and Number of Questions	
Part-A	<ul style="list-style-type: none">➤ 15 questions on basic mathematics and statistics➤ 10 questions on analytical skills
Part-B (Mathematics/Statistics stream)	<ul style="list-style-type: none">➤ 30 questions on advanced mathematics➤ 20 questions on statistics
Part-B (Economics stream)	<ul style="list-style-type: none">➤ 15 questions on microeconomics➤ 15 questions on macroeconomics➤ 20 questions on Indian economy and related topics

Note: The Part-B questions will be at UG level courses in Economics programs.

All questions MCQ type with four options. One mark for each correct answer and 0.25 negative mark for each wrong answer.

Sample Questions

Part A

1. A function whose derivative is a constant multiple of itself must be:
a. quadratic b. linear
b. logarithmic d. exponential
2. Find the third order derivative of $Y = 5X^3$:
a. 30 b. $15X^2$
c. $30X$ d. $5X^2$
3. $A = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 2 & 3 \\ 2 & 3 & 4 \end{bmatrix}$ $B = \begin{bmatrix} 1 & -2 \\ -1 & 0 \\ 2 & 1 \end{bmatrix}$ 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. $\begin{bmatrix} 2 & -2 \\ 5 & 3 \\ 7 & 4 \end{bmatrix}$
4. $\lim_{x \rightarrow 3} \frac{x-3}{3-x}$ is:
a. -1 b. 0 c. 1 d. 3
5. The function, $y=3x^2-14x+5$ at $x=4$ is:
a. decreasing b. increasing
c. stationary d. none of above
6. Probability of sure event is
a. 1 b. 0 c. -1 d. None of the above
7. A single letter is selected at random from the word PROBABILITY The probability that it is a vowel is
a. $3/11$ b. $2/11$ c. $4/11$ d. 0
8. If A and B are independent event, then $P(A \cap B)$ 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 $P\left(\frac{1}{2} < X < 1\right)$ using $F(x)$, given $0 < x < 1$
a. $P\left(\frac{1}{2} < X < 1\right) = F\left(\frac{1}{2}\right) - F(1)$ b. $P\left(\frac{1}{2} < X < 1\right) = F(1) - F\left(\frac{1}{2}\right)$
c. $P\left(\frac{1}{2} < X < 1\right) = F(1) + F\left(\frac{1}{2}\right)$ d. $P\left(\frac{1}{2} < X < 1\right) = F(1) - F(0)$
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

Part B

Mathematics-Statistics Stream

1. 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. $q(x) = -x^3 + 8x^2 + 3x - 34$
2. 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
3. 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
4. If $f(x) = x^3 - x + 3$ and $g(x) = 3$, then $f(g(x)) - g(f(x))$ is equal to:
- a. 24 b. 0 c. -24 d. 3
5. Let $f(x) = 2x^6 - x^4$. If n is the number of stationary points and m is the number of inflection points, then:
- a. $n+m = 6$ b. $n+m = 5$ c. $n+m = 2$ d. $n+m = 4$
6. The function, $y = -2x_1^2 + 4x_1x_2 - 5x_2^2 + 2x_2x_3 - 3x_3^2 + 2x_1x_3$ is:
- a. Positive definite b. Negative semi-definite
c. Negative definite d. Positive semi-definite
7. If $f(x, y) = x^2 + y^2 - 4$. What are the level curves $f(x, y) = k$?
- a. Hyperbolas for $k < -4$ b. Parabolas
c. Straight lines d. Circles for $k > -4$
8. The integral $\int \frac{dx}{x\sqrt{1-x^3}}$ is equal to
- a. $\frac{1}{3} \log \left| \frac{\sqrt{1-x^2} + 1}{\sqrt{1-x^2} - 1} \right| + C$ b. $\frac{1}{3} \log \left| \frac{\sqrt{1-x^3} - 1}{\sqrt{1-x^3} + 1} \right| + C$
c. $\frac{2}{3} \log \left| \frac{1}{\sqrt{1-x^3}} \right| + C$ d. $\frac{1}{3} \log |1-x^3| + C$
9. Suppose that X is a random variable for which the MGF is as follows:
 $\psi(t) = e^{b^2t^2/2+at}$ for $-\infty < t < \infty$. Find the mean and the variance of X .
- a. a and b^2 b. a and b c. $2a$ and b d. a^2 and b
10. If 2 balls are drawn one after another from a bag containing 3 whites and 5 black balls, what is the probability that
- (i) The first ball is white and 2nd is black?

(ii) One ball is white and the other is black?

- a. 15/56; 30/56 b. 8/56; 15/56 c. 15/56; 15/56 d. none of these

11. Let X be a continuous random variable with PDF: $f(x) = ax, 0 \leq x \leq 1$
 $f(x) = a, 1 \leq x \leq 2$
 $f(x) = -ax + 3a, 2 \leq x \leq 3$
 $f(x) = 0, \text{ o.w.}$

(a) Find a . (b) Compute $P(X \leq 1.5)$

- a. $\frac{1}{2}; \frac{1}{2}$ b. $1; \frac{1}{2}$ c. $\frac{1}{2}, \frac{1}{3}$ d. none of these

12. X is a continuous random variable with pdf $f(x) = 6x(1-x), 0 \leq x \leq 1$
Find b such that $P(X) < b = P(X) > b$

- a. $\frac{1}{2}$ b. 1.2 c. $\frac{2}{3}$ d. 1

13. Which of the following statements about hypothesis testing is true?

- a. If the p -value is greater than the significance level, we fail to reject H_0
b. A Type II error is rejecting the null when it is actually true.
c. If the alternative hypothesis is that the population mean is greater than a specified value, then the test is a two-tailed test.
d. The significance level equals one minus the probability of a Type I error.

14. A multiple-choice test has 30 questions. There are 4 choices for each question. A student who has not studied for the test decides to answer all the questions randomly by guessing the answer to each question. Which of the following probability distributions can be used to calculate the student's chance of getting at least 20 questions right?

- a. Binomial distribution b. Poisson distribution
c. Exponential distribution d. Uniform distribution

15. The mean and standard deviation of a normal distribution are 66 and 6 respectively. The approximate range within which the middle 50% of the values would lie is

- a. (62, 70) b. (60, 72) c. (63, 69) d. (64, 68)

Answers

Part – A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
d	a	a	a	b	a	c	a	b	d	d	a	c	a	d

Part – B (Economics Stream)

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
d	d	b	a	d	b	c	b	b	a	d	c	b	a	b

Part – B (Mathematics/Statistics Stream)

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
c	c	d	a	b	c	d	b	a	a	a	a	a	a	a