Open Elective Courses

Introduction

University Grants Commission has come up with the Choice Based Credit System (CBCS) in which the students have a choice to choose from the prescribed courses, which are referred as core, elective or courses and they can learn at their own pace and the entire assessment is graded-based on a credit system. The basic idea is to look into the needs of the students so as to keep up-to-date with development of higher education in India and abroad.

Choice Based Credit System (CBCS) is promoted in such a way that different open elective courses should be offered by every department in engineering to other departments. This interdisciplinary of learning open elective courses by other department students will have learning awareness and job oriented benefits. Students require the opportunity to choose any open elective course from different departments and apply their knowledge to acquire jobs in that field of course. Learning and employment benefits are not only through their own course subjects but also through open elective courses.

Advantages

- The CBCS offers a 'cafeteria' approach in which the students can choose open elective courses of their own choice.
- They can also opt for an interdisciplinary approach to learn a subject.
- The students have more scope to enhance their skills and more scope of taking up case studies, projects and assignments, vocational training including entrepreneurship.
- The system improves the job opportunities of students.
- The system will help in enabling potential employers assess the performance of students on a scientific scale.

Procedure

Every student shall earn 3 credits by choosing one of the open elective courses from the following list. Further students from a particular program, for example Electrical and Electronics Engineering., shall not opt for open electives offered by their own program. Students shall consult their class mentors before opting for an open elective course. Also, the students shall attend the orientation program, with regard to the selection of open elective courses scheduled on Jan 3rd 2019 for better understanding. The open elective courses on offer will be subject to availability of time table slot, faculty members, class rooms and minimum class strength specified from time to time.

Students may choose any one of the following courses.

Open Elective courses of 4th Semester

IV semester				
S. No	**Department**	**Open Elective Courses**		**Objectives**
1	**Department of EEE**	1	Operation and maintenance of Electrical systems in ships	• To understand the operation & troubleshooting of machines. • To maintain the electrical equipments with safety.
		2	Smart sensors	• To comprehend the principles behind sensors and its behaviors. • To impart knowledge on various Sensors and their applications.
2	**Department of Mechanical Engineering**	1	Production Technology	• To learn the various methods and types of castings, welding processes, sheet metal forming, plastics. • To impart knowledge on selection of suitable manufacturing process for the typical component. • To understand the working of machine tools such as lathe, shaper, planner, slotter, milling, hobbing, and grinding. • To know the basic concepts of NC and CNC machine tool programming and computer aided part programming • To control and operate NC and CNC machines.
		2	Fuels and Lubrication Technology	• To analyze important fuel and lubricant properties for the application in specific exploitation conditions • To compare the values of important physical properties of fuels and lubricants • To critically judge the values of important physical properties of fuels and lubricants for the application in specific working Conditions • To select fuels and lubricants for the

				application in specific exploitation conditions • To conduct the process of selecting fuels and lubricants and plan measurement of important physical properties of fuels and lubricants
3	**AMET Business School**	1	Managing People and Organization	• The students will be able to learn about the nature of management, understand the importance of planning and organizing, learn how to direct and control managerial activities, learn about personality and organizational behavior, and understand the importance and need for motivation.
		2	Introduction to Shipping Business	• The Students will be able to get an introduction to the shipping industry, learn the basic specifications of a ship, learn about the classification of cargoes and ships, get an insight about shipping practitioners and their organizations, and learn about the relationship between trading and shipping.
4	**Department of Naval Architecture and Offshore Engineering**	1	Ocean Observation and Measurement Techniques	• Understand the hydrographic survey methods • Recognize different ocean observation systems • Discuss the global climate change and the influence of ocean • Locate the use of different observation and measurement devices • Examine different measurement techniques used for ocean observation • Interpret the data and image processing methods.
		2	Marine Pollution Regulations	• Understand the nature of pollution and its possible sources • Instill the law of the sea key provisions • Apply measures and understand the requirement of pollution from oil and

				harmful substances • Understand the prevention of pollution from sewage and garbage • Evaluate the air pollution from ships during the initial phase of design • Assemble the learning for a safe and sound design of ships
5	**Department of Marine Biotechnology**	1	Microbiology for Petroleum Industry	• The aim of this course is to provide knowledge on microorganisms associated in the petroleum industry for enhanced oil recovery, production of hydrocarbon, degradation of hydrocarbons, bio indicators of hydrocarbon wealth etc. • This course would provide fundamental and advanced knowledge on Microbiology with special reference to petroleum industry and to make the students knowledgeable with respect to the subject and its practicable applicability. • To promote understanding of basic and advanced concepts in petroleum Microbiology. • To expose the students to various emerging areas of petroleum Microbiology. • To develop their ability to apply the knowledge of petroleum Microbiology in day to day life.
		2	Human Nutrition and Health	• The aim of this course is to give knowledge on nutrients that are essential for growth, development and maintenance of good health throughout life. • To understand the society needs and awareness regarding their diet. • The common Human is gradually switching towards nutrition scientists and dietitians for scientifically proved information on Nutrition and Dietetics. • To understand the life cycle of human and

				their requirement for healthy life. • To learn different practices for a healthy life which will be introduced by this course.
6	**Department of Petroleum Engineering**	1	Introduction to Oil & Gas Exploration	• To impart knowledge on Hydrocarbon exploration activities and the geological problems encountered in oil and gas wells during drilling / production and remedial measures to be undertaken.
		2	Storage, Handling & Transportation of Hydrocarbons	• To impart knowledge on Hydrocarbon storage and transportation activities. Evaluation of the various methods of crude oil and gas handling techniques and the hazards involved in each type of handling methods
7	**Department of Mining Engineering**	1	Geology Engineering	• Marine Engineers do use geotechnical survey and petroleum does exploration work. For the above things geological consideration is essential. Course aims to give fundamentals and applications for such engineering streams.
8	**Department of Marine Engineering**	1	Ship Safety and Environmental Protection	• To ensure awareness regarding Environmental Protection at Sea and to impart aspect of commitment
		2	Ship Recycling Marine Engineering	• To impart knowledge on the Ship Recycling
		3	Marine Engineering -I	
9	**Department of Food Processing Technology**	1	Food and Diet for Seafarers	• To introduce classification of Foods • To Elaborate importance of Diet and food for seafarers • To Brief Recommended Dietary Allowance for Seafarers • To Plan Diet Chart for seafarers • To indentify quality food and water in the deck
		2	Jam, Jelly, Pickle and Beverages	• To develop the knowledge of students raw materials selection for jam, jelly, pickle and beverages/ juices • To Prepare Jam from mixed fruits, and

				vegetables • To prepare Natural and synthetic jellies • To Prepare Beverages from natural sources and Synthetic materials • To understand basic storage conditions for jam, jelly, pickle and beverages
10	**Department of Information Technology**	1	Introduction to SCILAB Programming	Importance of the SCILAB course: • SCILAB (Scientific Laboratory) is a free and open source software alternative to MATLAB • SCILAB programming helps to develop engineering and science applications • Graphics functions to visualize, annotate and export data and to create and customize various types of plots and charts • Import/export of codes to third party tools is made easy • **Applications**: Data Mining, DSP, Optimization problems, Big Data Analytics and Data Visualization, GUI building, Model Reduction, SCILAB for Arduino application development, space mechanics, Modeling mechanical systems, hydraulic circuits, control systems etc. After the completion of the course, the students will be able to: • Write a simple program understanding the language structure of SCILAB • Apply basic concepts of vector and matrix operations • Perform plotting functions for data visualization • Apply programming skills in their area of specialization • Interpret and visualize simple mathematical functions and operations thereon using plots/display

		2	Information Technology for Office Automation	The course helps the students: • To knowhow Digital Office Administration works • To familiarise the office and internet tools used for office automation • To create and manage word documents • To design data templates for spreadsheets with graphs for data analysis • To make simple presentations and • To acquaint with internet access for coping with day-to-day activities of workplace and home
11	**Department of Mathematics**	1	Contributions of Ramanujam in Mathematics	• To know about the Indian mathematician S.Ramanujan and his contribution to mathematics to the world. • To develop the logical thinking of numbers and its properties. • To understand the knowledge of series and their convergence. • To know about the contribution of S.Ramanujan in Theory of Numbers. • To understand the knowledge of Irregular number and Continued fraction.
		2	Vedic Mathematics	• Instill love and remove the fear for Mathematics. • To promote Indian Mathematics. • To enhance computation skills in students. • Improve clarity on mathematical concepts. • Develop analytical thinking through Vedic Mathematics.
12	**Department of Chemistry**	1	Organic synthesis	• To understand the IUPAC nomenclature for alkanes, alkenes, alkynes and hydrocarbons. • To develop and understanding of SN1, SN2 and E1,E2 reactions with mechanism. • To acquaint the student with concepts of stereochemistry such as chiral, achiral molecule.identify chiral carbon as [R] or [S]. • To make the students conversant with classify organic molecule by their

				functional groups. • To understand the student conversant with asymmetric synthesis.
		2	Marine chemistry	• To understand the chemical properties of different bodies of water. • To understand the role of material input, output and internal cycling of the chemical components in the marine. • To make the students conversant with turbidity, currents, sediments, pH level atmospheric constituents, metamorphic activity. • To understand cycling of elements within the ocean driven primarily by process such as photosynthetic protection. • To make the students familiar with chemical oceanographic approaches to data collection and interpretation.
13	**Department of Physics**	1	Nano Sensors And Devices	• Students will be able to understand about the nanosensors that are nanoscale devices that measure physical quantities and convert those quantities to signals that can be detected and analyzed. • The course explains about the nature of sensors and characteristics methodology; • The students will be able to understand about the types of sensors and principles of different types of sensors; • The students will be able to understand about the electrochemical, thermometric and optical sensors.
		2	Advanced Functional Materials	• The study programme Advanced Functional Materials is research-oriented. • In the course Advanced Functional Materials, knowledge about synthesis and production method of functional materials and about the characterization of their specific properties are conveyed. • The students gain further experience in

				dealing with the typical chemical and physical methods of experimental and theoretical work in the interdisciplinary field. • In this course, students prove their ability to understand and solve reasonably complex scientific tasks under supervision. This promotes the competence in scientific cooperation.
14	**Department of Harbor and Ocean Engineering**	1	Basics of Harbor Engineering	
		2	Basics of Dredging Technology	
15	**Department of English**	1	Creative writing	• To enable students attain linguistic and grammatical competence to write innovatively • To achieve fluency and accuracy in writing skills • To equip students with creativity and enable them to write fiction and non-fiction • To help the students to develop quest for script writing and journalism. • To gain opportunity to work as editor, proof-reader and web-writer
		2	Cyber Literature	• To enable students attain read comprehensively from internet • To achieve fluency and accuracy in online writing skills • To equip students with digital resources • To help the students to develop quest for online reading • To gain opportunity to write and publish online

Open Elective courses of 6th Semester

VI semester				
S.no	**Department**	**Open Elective Courses**		**Objectives**
1	**Department of EEE**	1	Basics of electrical energy generation and distribution	• To impart knowledge on Power system generation and distribution systems • To realize substation, distribution system and tariff calculation
		2	Solar power systems	• To familiarize with the characteristics of solar radiation, its global distribution, and conversion methods of solar energy to heat and power. • To familiarize with the concepts of control and drives, importance of embedded system and implementation of control system for solar energy applications.
2	**Department of Mechanical Engineering**	1	Renewable Energy Sources	• To study the various forms of conventional energy resources. • To Learn the present energy scenario and the need for energy Conservation • To study the concept of various forms of renewable energy • To make Outline division aspects and utilization of renewable energy sources for both domestics and industrial application • To analyze the environmental aspects of renewable energy resources.
		2	Modern Manufacturing Techniques	• To make acquainted the various unconventional manufacturing Processes • To know about the applications of advanced manufacturing processes (which are exceptional) • To encourage the students for developing the models (experimental/theoretical) of Advanced Manufacturing Processes • To categorize the various unconventional manufacturing process based on energy

				sources and mechanism employed • To select the best suitable advanced manufacturing process for processing of unconventional materials employed in modern manufacturing industries
3	**AMET Business School**	1	Human Resource Management	• The Students will be able to understand the nuances of HR Management as distinct from other functional areas of Management, learn the need for human resource planning, get an exposure about training and development, understand the need for cross cultural management, and learn about the special features of maritime HRM.
		2	Global Logistics Management	• The Students will be able to get insight about international trade logistics & supply chain management, learn about international trade process and documentation, learn about the different Logistics Service Providers, get an exposure about supply chain design and strategy, and learn about relevance of warehouse with respect to logistics and supply chain management.
4	**Department of Naval Architecture and Offshore Engineering**	1	Elements of Geotechnical Engineering	• Choose suitable collecting, sampling and field property measurement tools for differentsoil • Interpret the characteristics of marine soil • Choose necessary laboratory tests to understand the site-specific behaviour offoundations • Analyze laboratory and field data to select appropriate shear strength values to use infoundation analysis • Distinguish different types of offshore foundations • Communicate with operators and designers in adjacent fields of Offshore Engineering

		2	Basic Principles of Marine Vehicle Design	• Understand marine environment and its complexity • Understand the design process of a marine vehicle design • Understand the stability of floating structure • Predict the ship resistance and powering • Understand ship motions and hull form design • Understand the marine vehicle structural design philosophy
5	**Department of Marine Biotechnology**	1	Marine Pollution and Biological Solutions	• The aim of this course is to understand the Fouling and corrosion problems in all the industries including marine. • To provide eco friendly solutions for both fouling and corrosion. • This course would provide insights into the role of living organisms in causing and controlling both fouling and corrosion with special reference to marine structures. • To provide an understanding of the corrosion principles and engineering methods used to minimize and prevent the corrosion • This course Basic knowledge on remedial measures for corrosion and Importance and forms of corrosion.
		2	Commercial products from Food Processing Wastes	• The aim of this course is to provide knowledge on how to process Food waste. • To understand the utilization of trash fishes or wastes from fish processing industries. • This course provides information on various fish by-products, utilization of fishery wastes. • This course provides the nutritional value thereby enhancing the waste management ability and entrepreneurship opportunities. • This course to provide to Develop broad idea on various value added products from fish waste such as proteins, oil, amino

				acids, minerals, enzymes, bioactive peptides, collagen and gelatin.
6	**Department of Petroleum Engineering**	1	Offshore Oil & Gas Operations	• To understand the basics of offshore structures, operations involved in drilling and production.
		2	Petroleum Policy, Law and Regulations	• To expose the students to the history and present status of both upstream and downstream Petroleum Sector of the world.
7	**Department of Mining Engineering**	1	Remote Sensing for Natural Resources	• For the students of marina nautical science and petroleum engineering stream modern and fast track survey is essential this course covers mainly modern and rapid survey practices.
		2	Marine Geology	
8	**Department of Marine Engineering**	1	Refrigeration & Air conditioning	• To learn different cycles of operation of the refrigeration system and working principle of the plant. • To learn difference between domestic and marine refrigeration system • To gain knowledge about the refrigeration and air conditioning compressors construction.
		2	Material handling Equipments	• To study and select different types of handling equipment as per the requirement onboard the ship • To learn about design of various components used for cargo handling • To study working principles and operation different types of conveyors and escalators
9	**Department of Food Processing Technology**	1	Consumer prospective of Food Safety and Standards laws	• To brief Indian Food Safety and Standard laws • To elaborate general safety norms for Packed foods • To create awareness about Food Safety • To understand major International food standards

		2	Bakery products Technology	• To introduce basic ingredients used in Bakery industries • To brief process of bread and cake making • To elaborate biscuits and cookies preparation • To explain puffs and doughnut preparation
10	**Department of Information Technology**	1	Data Analysis and Visualization	The course helps the students to: • Know how to utilize the simple Excel and SCILAB tools for data analysis and charting • Learn to use the tools for numerical and statistical analysis of the given data • Know how to solve the Engineering Problems using Excel and SCILAB tools • Understand the optimization techniques • Know to visualize the results in the form of charts to arrive at the inferences from the data collected • Learn to use SCLIAB for image processing applications
		2	Python Programming	Importance of Python Language: • Python is a general-purpose language, which means it can be used to build anything • Python is used for testing microchips at Intel, powering Instagram, building video games etc. • Python is great tool for backend web development, data analysis, artificial intelligence, and scientific computing • Python finds its utility in Browser automation, robotics, Arduino applications • Some companies that use python are:Google (Youtube), Facebook (Tornado), Dropbox, Yahoo, NASA, IBM, Mozilla,Quora :D, Netflix Upon completing the Course, the students will be able to

				• Write a simple Python program following the basic syntactical structure of Python Language • Use the built-in function and function objects in the Program • Apply Error catching and Exception handling mechanisms Apply the OOPS concepts wherever it is appropriate
11	**Department of Mathematics**	1	Numerical methods and programming	• To provide the knowledge to student with numerical methods of solving the non-linear equations and simultaneous equations. • To provide the knowledge differentiation an integration by numerical methods. • To provide the knowledge of Numerical solution of ordinary differential equation in linear and nonlinear. • To provide the student with knowledge of Matlab • To improve the student's skills in numerical methods by using the Matlab software.
		2	Industrial Statistics	• To list formulae for mean, median, mode and practice the problems related to them. • To discuss the concepts of measures of dispersion and compute the coefficient of • skewness, moments and kurtosis. • To describe Analysis of Variance and classify the given problems using ANOVAmethod. • To demonstrate the control charts with respect to measurements and attributes. • To express various methods connected with time series analysis.
		1	Nano Chemistry	• To introduce students with basic concept of nano chemistry and changes of chemical and physical properties. • To understand the nanotechnology methods and materials can be

				functionalized for drug delivery. • To make the student conversant with nano chemical protect the skin against harmful UV light. • To introduce students to the synthesis, characterization fictionalization and application of nano materials. • To understand the most commonly used nanotube and its application in industry.
12	**Department of Chemistry**	2	Green Chemistry	• To understand the basic concept of green chemistry. • To create awareness about the pollution-prevention. • To develop the protocol for dispatch the chemical hazardous. • To design and produce cost competitive chemical products. • To understand the recycling process in environmental safe manner.
13	**Department of Harbor and Ocean Engineering**	1	Physical and Numerical Modelling in Coastal Engineeing	
		2	Marine Instrumentation	
		1	Energy Storage Materials And Devices	• The students will be able to understand about Energy Storage Materials and their applications in electrochemical energy devices such as batteries, supercapacitors, fuel cells, etc. • The course explains about various synthesis routes of nano materials and their applications in energy storage devices; • The students will be able to understand about the principle, construction and working of energy storage devices; • The students will have knowledge on current issues on energy storage devices and also learn about current innovations and technological improvements.

14	**Department of Physics**	2	Nanophotonics	• The course explains about fundamentals of electromagnetic properties of nanostructures, wave equations and optics; • The students will be able to understand about photonic crystals, and features of photonic crystals; • The students will have knowledge about plasmonics and Plasmonic nanosensors.
15	**Department of English**	1	English for Career Development	• To enable students advance careers in global market • To achieve fluency and accuracy in career skills • To equip students with global career objectives • To help the students to develop professional ethics • To gain knowledge to face interviews and global challenges
		2	Business English in Globalised World	• To enable students attain entrepreneur skills • To become world leaders and team players • To equip students with business English to work with foreign counterparts • To help the students to develop global communication to help client services • To learn English proficiency to participate in technical and business transactions