MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

International Centre for Applied Sciences

(A Constituent Unit of MAHE Manipal, India)

B. Sc. (APPLIED SCIENCES)

A Bachelors Degree Programme under MAHE, Manipal

ACADEMIC REGULATIONS and COURSE STRUCTURE OF FIRST TO FOURTH SEMESTER

(2018 - 2020)

Applicable for the 2018Admission Batch

ADDRESS : **Academic Block - 5**
LG-2, MIT Campus,
MANIPAL – 576104,
KARNATAKA, INDIA

Telephone : **+91 – 820 - 2571060 extn. 24018**
+91 – 820 – 2571083, 2924026

Fax : **+91 – 820 - 2924018**

E – Mail : ***office.icas@manipal.edu***

Website : **www.manipal.edu/icas.html**

BACHELOR OF SCIENCE PROGRAMME IN ENGINEERING
RULES & REGULATIONS

1. INTERNATIONAL TRANSFER PROGRAM (ITP) IN ENGINEERING:

International Centre for Applied Sciences (ICAS), Manipal is offering a full time (three years), B.Sc.(Applied Sciences) Degree program **with a provision for credit transfer to any of the foreign universities at the end of second year of studies.**

It is a unique program where the students usually spend the first two years in ICAS, Manipal and the following two years in a university abroad, of their choice (the full time, international engineering degree awarded by the foreign university only). The credit transfer will depend upon the academic policy of the respective foreign universities and can be up to 100%. This is made possible by adopting the high quality curriculum, teaching and evaluation methodologies that are followed by top universities abroad.

Since 1994, about 1700 students have entered more than 100 foreign universities (spread across USA, UK, Australia, Germany, France, Canada & the like countries) through acceptable credit transfer from ICAS, pursuing their Bachelor/Master Degree in Applied Sciences/Engineering.

The following streams are offered at ICAS under the International Transfer Program:

- Aeronautical/Aviation
- Chemical
- Civil
- Computer Science & Engineering
- Electrical & Electronics
- Mechanical
- Mechatronics

Students opting for Aviation/Aeronautical stream only can take credit transfer after the first year. All other students are required to complete two years of study at ICAS before getting their credits transferred to foreign universities. The academic year at ICAS is divided into two Semesters. Each Semester is of 14 to 16 weeks duration. During the first semester, the students of all the branches study common subjects. Adequate importance is given to English Communication, Basic Sciences and Humanities during the entire period of two years at ICAS, as required by the foreign Universities.

2. CREDIT TRANSFER FLEXIBILITY:

Students can switch over from the above mentioned core streams to any of the allied streams/specializations at the university abroad, during credit transfer. For example, the students who studied at ICAS in the stream Computer Science can continue in the same discipline or can switch over to Computer Engineering or Information Science or related fields. Similarly, from Electrical & Electronics stream to core Electrical Engineering or Electronics & Communication specializations and from Mechanical to core Mechanical or Automobile or Production/Manufacturing/Industrial Engineering streams at the foreign university.

3. ELIGIBILITY FOR ADMISSION

Pass in 10+2 (CBSE, ICSE, “A” level, IB, HSC, OSSD, American High School Diploma or Equivalent Examination) with a minimum of 60% (aggregate) or ‘C’ grade in English, Physics and Mathematics with Chemistry or Biology or Computer Science or Biotechnology or Electronics as optional subjects in the 12th standard.

4. ACADEMIC CALENDAR

The academic calendar will be prepared by ICAS in line with the academic calendar of MAHE, Manipal before the commencement of the classes for both Odd Semester and Even Semester of the Academic Year, containing the dates for:

- Commencement of the classes
- Internal Assessment tests and Student Feedback
- Last instructional day
- Start and End dates for the end semester examination
- Result declaration date
- Date for paper seeing & revaluation
- Date of declaration of revaluation results
- Make-up examination dates
- General Holidays and Co-curricular & Extra-curricular Events

5. ACADEMIC/EXAMINATION REGULATIONS

A) 75% attendance is compulsory to the classes of any subject under any circumstances. If a student is unable to satisfy this minimum attendance requirement he/she will not be permitted to attend the end semester examination of that subject and will get detained, as per the institute/university attendance regulations.

B) A student has to re-register for those subjects in which he/she was not allowed to write the end-semester examination due to shortage of attendance (less than 75% of the classes conducted for the subject). The institute will conduct special classes (crash course) in the evening (after regular teaching hours) for such re-registered students. The re-registered student has to attend internal assessment tests (which are conducted exclusively for them) and must fulfill the minimum attendance regulation (75%) to be eligible to write the End Semester Examination. No condoning of attendance for any reason is permitted during such crash courses.

C) Any student desirous of improving internal assessment marks in the subject(s) of the previous semesters has to reject the particular subject(s) of that semester/year and has to re-appear for the IA tests/submit assignments and write the end-semester exam. along with the regular students of that particular semester/year (Odd in Odd and Even in Even semesters, respectively) by paying the prescribed fees. Such a student cannot claim to revert to the old IA marks/end exam. marks if the new marks are lower than those of the former attempt.

D) The maximum duration for a student for passing/re-appearing in any subject offered, is twice the duration of the academic programme from the date of joining. This applies also to the students who discontinue the academic programme for any reason and rejoins the programme at a later date.

E) After the expiry of the above validity period, the student may get admitted afresh to the programme and repeat all semesters from the beginning. In such cases, the student will be governed by the rules, regulations, courses of study and syllabi in force at the time of re-admission.

F) Change of branch is allowed on prior written request, against vacancies, before the commencement of the second semester, based on the academic performance in the first semester at ICAS.

5.1 Internal Assessment

- A total weightage of 50 marks is reserved for internal assessment in theory subjects.
- Two internal tests, each of 20 marks, are conducted for all the courses registered in a semester.
- First test will be conducted after five weeks of the commencement of the program and the second test will be conducted after ten weeks of the commencement of the program.
- Ten marks are reserved for two assignments to be given during the program (each assignment carries five marks). The assignments will be given between the first test and the make-up test.
- If a student is unable to attend any one of the tests because of ill health or other genuine reasons or is desirous of improving his IA marks, a make-up test may be given after the second test.

5.2 End Semester Assessment

- The maximum marks for the theory examination are 100. Out of this, 50 marks are for the Internal Assessment and 50 for the end-semester examination. For convenience, end semester assessment will be conducted for 100 marks and then scaled down to 50.
- The minimum marks (cut-off) for passing a subject is 50% of the total, when the end-semester theory (or practical) & the Internal Assessment marks are put together, with a minimum of 35% marks to be scored in each subject (theory:18/practical:09), in the end semester examination.
- The student performance in laboratory courses is evaluated out of a maximum of 50 marks. It is based on in-semester assessment of 25 marks (reflecting the performance of the student in the conduct of the experiment, regularity and timely submissions) and end-semester lab. examination component (internal) of 25 marks. Completing all the prescribed experiments and attending the lab. examination at the end of the semester on the specified date & time, is mandatory. No change of date & time for the lab. examination is permitted, once notified.

5.3 Duration of the Examination & Tests

The end semester examination will be of three hours duration and the internal assessment tests will be of one hour duration each.

5.4 Mini Projects

Students need to take-up mini projects under the guidance of faculty in minimum one of their third as well as fourth semester laboratory courses. This will enable them to earn one additional credit.

6. GRADING, RESULT AND ISSUE OF GRADE CARDS

6.1 ICAS shall follow FOUR LETTER, Fixed Grading system which is as follows:

Letter Grading System:

Letter Grade	Percent Equivalent Marks	Grade Value
A (Outstanding)	100 – 90	**4.0**
B+ (Very Good)	89 – 80	**3.5**
B (Good)	79 – 70	**3.0**
C+ (Above Average)	69 – 60	**2.5**
C (Average)	59 – 50	**2.0**
F (Fails)	Below 50	**0.0**

Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA):
Each course grade is converted into a specific number of points associated with the grade. These points are weighted in accordance with the number of credits assigned to a course.

The weighted average of GPAs of all semesters that the student has completed at any point of time is the Cumulative Grade Point Average (CGPA) at that point of time. CGPA is updated after every semester the student completes.

Calculation of GPA and CGPA:
Example:

Subjects	Credits	Letter Grade	Grade Value	Credit x Value	Grade Points
MATHS	4	C+	2.5	4x2.5	10
PHYSICS	3	C	2	3x2	6
CHEMISTRY	3	B+	3.5	3x3.5	10.5
EG – I	4	B	3	4x3	12
TOTAL	14				38.5

In this case, GPA = $\frac{\text{total grade points}}{\text{total credits}}$

$= \frac{38.5}{14} = 2.75$

Suppose the GPA in four consecutive semesters are 3.0, 2.91, 2.80 and 3.95 with 22, 22, 18 and 19 respective course credits, then the
CGPA = (3.0x22+2.91x22+2.80×18+3.95×19) / (22+22+18+19) = 3.15

Generally:

$$GPA = \frac{\sum_{i=1}^{n} Ci\,Gi}{\sum_{i=1}^{n} Ci} \quad \text{and} \quad CGPA = \frac{\sum_{j=1}^{N} GPAj \times (\Sigma Ci)j}{\sum_{j=1}^{N} (\Sigma Ci)j}$$

where n = number of courses
Ci = course credit
N = number of semesters
Gi = corresponding grade value

6.2 Results are declared by Director (ICAS) along with Examination Coordinator (ICAS) and a copy of same is sent to MAHE, Manipal.

6.3 Grade Cards are prepared and printed by MAHE, Manipal and signed by Registrar (Evaluation) of MAHE and Director (ICAS).

6.4 Consolidated marks cards: If a candidate has taken more than one attempt to pass in all the subjects of a semester examination, he/she can apply for consolidated marks card of the semester from MAHE. In this marks card, only the marks of the passed attempts are shown along with the month and the year of passing the subjects.

6.5 Any malpractice cases reported during the IA tests / End-semester examination / Make-up examination will be dealt with, as per university/institute guidelines.

7. APPEAL PROCESS

7.1 In only the Theory subjects of end-semester examination, students are allowed to request for paper seeing and/or revaluation by paying the prescribed fee. However the marks scored in the revaluation of such theory subjects will be final and a binding on the student.

7.2 Scripts and scheme of evaluation are made available at the time of paper seeing.

7.3 ICAS will assign a different examiner for revaluation, as far as possible.

7.4 Fees will be refunded in case of Grade improvement.

8. MAKE-UP EXAMINATION

8.1 Make-up examinations will be held during every semester break (soon after the announcement of revaluation results) to help the regular students to pass the subjects in which they have got F/I grade, during the same semester.

8.2 A maximum of C+ grade only will be awarded in the make-up examination, irrespective of their performance in the F/I subjects. Make-up examination will be conducted on continuous days and there will be no paper seeing/revaluation options.

9. STUDENT ATTENDANCE REGULATIONS

All the students are expected to attend all the classes in each subject. However, it is mandatory for a student to have a minimum of 75% attendance in individual subjects, for being eligible to write the end-semester examination, in compliance with the MAHE Norms. In case of Laboratory classes, completing all the experiments is a pre-requisite for in-semester assessment.

The above 25% condoning of the attendance takes care of his/her absence due to any medical/personal reasons/purposes including writing eligibility exams, attending passport/visa related works, emergency & hospitalization cases etc. and there is no question of considering any medical certificate when a student has deficiency of attendance beyond 25%. Students are advised to take eligibility exams. like TOEFL/IELTS/SAT during vacation period only.

Generally, the above 25% condoning of the attendance includes his/her absence in the class on account of representing the institute/university in the co-curricular/extra-curricular activities also. However, as an encouragement to the students involving in such activities, further condoning of attendance up to a maximum limit of 10% of the total classes held in the individual course in that semester may be permitted (not applicable to crash courses), subject to the following conditions:

(1) The desirous student must apply for the same and obtain prior permission (in writing, in the forms available in ICAS Office) from the Associate Director, without which no request for condoning of attendance will be entertained.

(2) The student has to obtain authentication/endorsement in the same form, from the concerned authorities (listed below) authenticating his/her participation in the said activity and has to produce it at the ICAS office strictly within two weeks after the event. No letter received after this duration will be entertained for condoning of attendance.
(3) Associate Director will further instruct the concerned teachers handling the course to consider such cases for condoning of attendance, subject to a maximum ceiling of 10% of the total classes held in that course.

Sl. No.	Nature of Event	Authority for Endorsement
01	Representing Inter-Institute / Inter-University Sports activity	Director of Physical Education, (MIT/MAHE)
02	Representing Inter-Institute / Inter-University Cultural activity / competitions	Faculty Coordinator, Student Activities, ICAS / Deputy Director, Student Affairs, MAHE
03	Presenting papers in Conferences / Tech. Fests / Research Colloquiums etc.	Faculty Coordinator of Student Counseling, ICAS
04	Writing Eligibility Exams like TOEFL/IELTS etc. and attending Passport/Visa related activities (only in exceptional cases, only for the days of exam/meeting, with proof)	Associate Director, ICAS

Students are advised to check their attendance position regularly from the respective teachers and try to make up for the attendance shortage, if any by attending all the remaining classes. Branch Faculty Coordinators / Subject Teachers shall display the student attendance position along with IA test marks, a week after the first & second tests respectively, monitor the attendance position of irregular students and initiate appropriate remedial steps.

10. TEACHER GUARDIANSHIP (TG) and FACULTY ADVISER (FA) SCHEMES

In order to monitor the academic progress of the students and to supervise their welfare, ICAS has arranged teacher guardianship/faculty adviser scheme. A batch of 10 to 15 students will be allotted to a subject handling teacher who will act as a friend, philosopher and guide to these students. The TGs will be in touch with the parents/guardians of the students to inform them the progress/welfare of these students.

In the second year, 20 to 25 students are allotted to each faculty handling respective branch classes and will act as Faculty Adviser (FA). The role of FA is almost same as TG, but in addition they advise / guide them towards their future academic plans in their respective chosen branches.

The parents/guardians are also advised to keep in touch with the respective TGs/FAs of their wards.

The Associate Director of ICAS along with the Faculty Coordinator of Student Welfare will monitor these schemes and will counsel the students from time to time.

COURSE STRUCTURE
B.Sc. (CHEMICAL)

FIRST YEAR - I SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS –I	3–1-0–4
IPH 111	PHYSICS- I	3–0-0–3
ICE 111	MECHANICS OF SOLIDS	3–1-0–4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3–1-3–5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3–0-0–3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3–0-0–3
IME 111	ENGINEERING GRAPHICS - I	0–0-3–1
		18–3-6-23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3–1-0–4
IPH 121	PHYSICS – II	3–0-3–4
ICH 121	CHEMISTRY	3–0-3–4
IME 121	ENGINEERING GRAPHICS - II	0–0-3–1
ICHM 121	CHEMICAL PROCESS CALCULATIONS	3–1-0–4
ICHM 122	CHEMICAL ENGINEERING THERMODYNAMICS-I	3–1-0–4
		15–3–9-21

SECOND YEAR - THIRD SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 231	MATHEMATICS - III	3–1-0–4
ICHM 231	FLUID FLOW OPERATIONS	3-0-6-5
ICHM 232	CHEMICAL ENGINEERING THERMODYNAMICS-II	3-1-0-4
ICHM 233	PROCESS PLANT MATERIALS	3-0-0-3
ICH 231	ORGANIC CHEMISTRY-I	4-0-0-4
ICH 232	ORGANIC CHEMISTRY-II	3-0-0-3
		19- 2 -6 –23

FOURTH SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IHS 241	ENGINEERING ECONOMICS & MANAGEMENT	3–1-0–4
ICHM 241	CHEMICAL REACTION ENGINEERING	3-1-0-4
ICHM 242	HEAT TRANSFER OPERATIONS	3-0-6-5
ICHM 243	MASS TRANSFER-I	3-0-0-3
ICH 241	INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS	3-0-0-3
IBT 231	BIO-CHEMISTRY	3-0-3-4
		18-2- 9– 23

B.Sc. (CIVIL)

FIRST YEAR - I SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS –I	3–1-0–4
IPH 111	PHYSICS- I	3–0-0–3
ICE 111	MECHANICS OF SOLIDS	3–1-0–4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3–1-3–5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3–0-0–3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3–0-0–3
IME 111	ENGINEERING GRAPHICS - I	0–0-3–1
		18–3-6-23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3–1-0–4
IPH 121	PHYSICS – II	3–0-3–4
ICH 121	CHEMISTRY	3–0-3–4
IME 121	ENGINEERING GRAPHICS - II	0–0-3–1
ICE 121	BUILDING SCIENCE AND TECH.	3–1-0–4
ICE 122	MECHANICS OF STRUCTURES	3–1-0–4
		15–3–9-21

SECOND YEAR - THIRD SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 231	MATHEMATICS – III	3–1-0–4
ICE 231	BASIC REINFORCED CONCRETE DESIGN	3-1-0-4
ICE 232	FLUID MECHANICS	3-1-0-4
ICE 233	GEOTECHNICAL ENGG.	3-1-0-4
ICE 234	SURVEYING	3-1-0-4
ICE 235	SURVEYING PRACTICE	0-0-3-1
ICE 236	MATERIAL TESTING LABORATORY	0-0-6-2
		15-5-9-23

FOURTH SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IHS 241	ENGINEERING ECONOMICS & MANAGEMENT	3–1-0–4
ICE 241	HIGHWAY ENGG.	3-1-0-4
ICE 242	BUILDING DESIGN AND DRAWING	0-0-3-1
ICE 243	WATER SUPPLY ENGG.	4-0-0-4
ICE 244	BASIC STRUCTURAL STEEL DESIGN	3-1-0-4
ICE 245	ANALYSIS OF INDETERMINATE STRUCTURES	3-1-0-4
ICE 246	FLUID MECHANICS LABORATORY	0-0-6-2
		16-4-9-23

B.Sc. (COMPUTER SCIENCE & ENGINEERING)

FIRST YEAR - I SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS –I	3–1-0–4
IPH 111	PHYSICS- I	3–0-0–3
ICE 111	MECHANICS OF SOLIDS	3–1-0–4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3–1-3–5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3–0-0–3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3–0-0–3
IME 111	ENGINEERING GRAPHICS - I	0–0-3–1
		18–3-6-23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3–1-0–4
IPH 121	PHYSICS – II	3–0-3–4
ICH 121	CHEMISTRY	3–0-3–4
ICS 121	JAVA PROGRAMMING	3–1-3–5
ICS 122	COMPUTER ORGANIZATION AND ARCHITECTURE	3–1-0–4
		15–3–9-21

SECOND YEAR - THIRD SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 231	MATHEMATICS - III	3–1-0–4
ICS 231	DATA STRUCTURES	3–1-3–5
ICS 232	SWITCHING CIRCUITS AND LOGIC DESIGN	3–1-3–5
ICS 233	SOFTWARE DESIGN USING OBJECT ORIENTED PARADIGM	3–0-6–5
IEC 231	ANALOG ELECTRONIC CIRCUITS	3–1-0–4
		15–5–9-23

FOURTH SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IHS 241	ENGINEERING ECONOMICS & MANAGEMENT	3–1-0–4
ICS 241	MICROPROCESSORS	3–0-6–5
ICS 242	DATABASE MANAGEMENT SYSTEMS	2–1-3–4
ICS 243	OPERATING SYSTEMS	2–1-0–3
ICS 244	DESIGN AND ANALYSIS OF ALGORITHMS	2–1-0–3
IEE 241	SIGNALS AND SIGNAL PROCESSING	3–1-0–4
		15–6–6-23

B.Sc. (ELECTRICAL & ELECTRONICS)

FIRST YEAR - FIRST SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS –I	3–1-0–4
IPH 111	PHYSICS- I	3–0-0–3
ICE 111	MECHANICS OF SOLIDS	3–1-0–4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3–1-3–5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3–0-0–3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3–0-0–3
IME 111	ENGINEERING GRAPHICS - I	0–0-3–1
		18–3-6-23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3–1-0–4
IPH 121	PHYSICS – II	3–0-3–4
ICH 121	CHEMISTRY	3–0-3–4
IME 121	ENGINEERING GRAPHICS - II	0–0-3–1
IEE 121	ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING	3–1-0–4
IEC 121	LOGIC DESIGN	3–1-0–4
		15–3–9-21

SECOND YEAR - THIRD SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 231	MATHEMATICS - III	3–1-0–4
IEC 231	ANALOG ELECTRONICS CIRCUITS	3–1-0–4
IEC 233	ELECTROMAGNETIC THEORY	3–1-0–4
IEE 231	NETWORK ANALYSIS	3–1-0–4
IEE 234	MICROCONTROLLERS	3–1-0–4
IEC 232	DIGITAL ELECTRONICS LABORATORY	0–0-6–2
IEE 232	CIRCUITS SIMULATION LABORATORY	0–0-3–1
		15–5–9-23

FOURTH SEMESTER

SUBJECT CODE	SUBJECT		THEORY/TUTORIAL/LAB./ CREDITS
IHS 241	ENGINEERING ECONOMICS & MANAGEMENT		3–1-0–4
IEC 241	IC SYSTEMS		3–1-0–4
IEE 241	SIGNALS AND SIGNAL PROCESSING		3–1-0–4
IEC/IEE 243	ELECTIVE-I	VLSI DESIGN POWER SYSTEM ANALYSIS	3–1-0–4
IEC/IEE 244	ELECTIVE-II	DSD USING VERILOG ELECTRICAL MACHINES	3–1-0–4
IEC 242	LINEAR IC LABORATORY		0–0-3–1
IEE 242	MICROCONTROLLER LABORATORY		0–0-6–2
			15–5–9-23

B.Sc. (MECHANICAL)

FIRST YEAR - I SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS – I	3 – 1 – 0 – 4
IPH 111	PHYSICS- I	3 – 0 – 0 – 3
ICE 111	MECHANICS OF SOLIDS	3 – 1 – 0 – 4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3 – 1 – 3 – 5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3 – 0 – 0 – 3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3 – 0 – 0 – 3
IME 111	ENGINEERING GRAPHICS – I	0 – 0 – 3 – 1
		18 – 3 – 6 – 23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3 – 1 – 0 – 4
IPH 121	PHYSICS – II	3 – 0 – 3 – 4
ICH 121	CHEMISTRY	3 – 0 – 3 – 4
IME 121	ENGINEERING GRAPHICS - II	0 – 0 – 3 – 1
IME 122	BASIC MECHANICAL ENGINEERING	3 – 1 – 0 – 4
IME 123	STRENGTH OF MATERIALS	3 – 1 – 0 – 4
		15 – 3 – 9 – 21

SECOND YEAR - THIRD SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 231	MATHEMATICS – III	3 – 1 – 0 – 4
IME 231	THERMAL ENGINEERING	3 – 1 – 0 – 4
IME 232	MANUFACTURING PROCESS ENGINEERING	4 – 0 – 0 – 4
IME 233	MATERIAL SCIENCE AND METALLURGY	3 – 0 – 0 – 3
IME 234	FLUID MECHANICS	3 – 0 – 0 – 3
IME 235	AUTOMOBILE ENGINEERING	3 – 0 – 0 – 3
IME 236	COMPUTER AIDED MECHANICAL DRAWING	0 – 0 – 6 – 2
IME 237	STRENGTH OF MATERIALS LABORATORY	0 – 0 – 3 – 1
		19 – 2 – 9 – 24

FOURTH SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IHS 241	ENGINEERING ECONOMICS & MANAGEMENT	3 – 1 – 0 – 4
IME 241	THEORY OF MACHINES	3 – 1 – 0 – 4
IME 242	DESIGN OF MACHINE ELEMENTS	3 – 1 – 0 – 4
IME 243	INTERNAL COMBUSTION ENGINES	3 – 0 – 0 – 3
IME 244	METROLOGY AND MEASUREMENTS	3 – 1 – 0 – 4
IME 245	FLUID MECHANICS LABORATORY	0 – 0 – 3 – 1
IME 246	WORKSHOP PRACTICE	0 – 0 – 3 – 1
IME 247	THERMAL ENGINEERING LABORATORY	0 – 0 – 3 – 1
		15 – 3 – 12 – 22

B.Sc. (MECHATRONICS)

FIRST YEAR - I SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS –I	3–1-0–4
IPH 111	PHYSICS- I	3–0-0–3
ICE 111	MECHANICS OF SOLIDS	3–1-0–4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3–1-3–5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3–0-0–3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3–0-0–3
IME 111	ENGINEERING GRAPHICS - I	0–0-3–1
		18–3-6-23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3–1-0–4
IPH 121	PHYSICS – II	3–0-3–4
ICH 121	CHEMISTRY	3–0-3–4
IME 121	ENGINEERING GRAPHICS - II	0–0-3–1
IME 122	BASIC MECHANICAL ENGINEERING	3–1-0–4
IEE 121	ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING	3–1-0–4
		15–3–9-21

SECOND YEAR - THIRD SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 231	MATHEMATICS - III	3–1-0–4
IMET 231	ELEMENTS OF MECHATRONICS SYSTEMS	3–0–0–3
IMET 232	KINEMATICS OF MACHINES	2–1–0–3
IMET 233	MATERIAL SCIENCE AND ENGINEERING	3–0–0–3
IMET 234	ANALOG AND DIGITAL SYSTEM DESIGN	3–0–0–3
IEC 231	ANALOG ELECTRONICS CIRCUITS	3–1–0–4
IMET 235	CAD LABORATORY	0–0–3–1
IEC 232	DIGITAL ELECTRONICS LABORATORY	0–0–6–2
		17–3–9-23

FOURTH SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IHS 241	ENGINEERING ECONOMICS & MANAGEMENT	3–1-0–4
IMET 241	MICROCONTROLLER AND APPLICATIONS	3–0–0–3
IMET 242	PROGRAMMABLE LOGIC CONTROLLER	3–0–3–4
IMET 243	AUTOMATED MANUFACTURING SYSTEMS	3–0–0–3
IMET 244	INDUSTRIAL ROBOTS	3–0–0–3
IEE 241	SIGNALS AND SIGNAL PROCESSING	3–1-0–4
IEE 242	MICROCONTROLLER LABORATORY	0–0-6–2
		18–2–9–23

B.Sc. (AERONAUTICAL/AEROSPACE/AVIATION)

FIRST YEAR - I SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 111	MATHEMATICS –I	3–1-0–4
IPH 111	PHYSICS- I	3–0-0–3
ICE 111	MECHANICS OF SOLIDS	3–1-0–4
ICS 111	PROBLEM SOLVING USING COMPUTERS	3–1-3–5
IHS 111	A COURSE ON PSYCHOLOGY FOR ENGINEERS	3–0-0–3
IHS 112	COMMUNICATION SKILLS IN ENGLISH	3–0-0–3
IME 111	ENGINEERING GRAPHICS - I	0–0-3–1
		18–3-6-23

SECOND SEMESTER

SUBJECT CODE	SUBJECT	THEORY/TUTORIAL/LAB./ CREDITS
IMA 121	MATHEMATICS – II	3 – 1 – 0 – 4
IPH 121	PHYSICS – II	3 – 0 – 3 – 4
ICH 121	CHEMISTRY	3 – 0 – 3 – 4
IME 121	ENGINEERING GRAPHICS - II	0 – 0 – 3 – 1
IME 123	STRENGTH OF MATERIALS	3 – 1 – 0 – 4
IAV 121	INTRODUCTION TO AEROSPACE ENGINEERING AND AVIONICS	3 – 1 – 0 - 4
		15 – 3 – 9 – 21