Choice Based Credit System

based on UGC Guidelines

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UGC GUIDELINES ON ADOPTION OF CHOICE BASED CREDIT SYSTEM

UNIVERSITY GRANTS COMMISSION

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DELHI — 110 002

Preamble

- The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country.

- The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

- The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system.

Preamble

- While the HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching–learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students.

- Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both.

- The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country.

- The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

Major global System

- The major system engaged in Higher Education in the global scenario is operating a system of credits.

- The European Credit Transfer System (ECTS),

- the 'National Qualifications Framework' in Australia,

- the Pan-Canadian Protocol on the Transferability of University Credits,

- the Credit Accumulation and Transfer System (CATS) in the UK as well as the systems operating in the US, Japan, etc are already in a system of credit to measure the level of competency.

Choice Based Credit System (CBCS).

CBCS operates on modular pattern based on module/units called "credits" wherein 'credit' defines the quantum of contents/syllabus prescribed for a course/paper and determines the minimum number of teaching-learning hours required.

The University has to adopt Choice Based Credit System (CBCS) in all the programmes of the study including Masters Degree Programme.

Present System

- What is Lacking in the Present System?

- **Teacher centric approach**

- Teacher never asks, "why am I teaching this, what will students do after this exposure?"

- What are the kinds of activities student should be engaged to have "learning opportunities"?

Hostel food vs Cafeteria

- Present system is like food served in a jail.

- Menu is decided by some one and you follow and serve same to all in fixed quantity.

- CBCS is like food available in Cafeteria. It is like, a coupon is given and you can buy as you want with in the limit of the coupon.

Hostel food vs Cafeteria

- In a better System, it is like food served in north Indian Mughalai menu.
- But what if a you like to have Chinese noodle or some light meal like burgers.
- If you have an appetite, you go out and eat there.
- It is like, some students go out and join extra course or join coaching centre for preparing for future employment
- **CBCS can give all these.**
- AFU can also give choice and make sure he complete degree with minimum credits to extra credits with in the appetites/ ability of the student.

What is Lacking in the Present System?

- Lacks context based approach
- There are no or little opportunities for
  - **Group work**
  - **Individual work**
  - **Data collection**
  - **Field work**
  - **Quizzes**
  - **Class tests**
  - **Community involvement**

What is Lacking in the Present System?

- No inter-disciplinary mobility possible
- Lack of multi-disciplinary, closed isolated environment
- Lack of choices for the student
- No opportunity to the learner to walk out and walk in to earn a certification
- No scope to introduce latest knowledge in the curriculum
- Learning goals of the course and learning objectives of the units/submits never enunciated

CBCS permits students to:-

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3. **Undergo additional/value added courses and acquire more than the required number of credits, depending upon the learner's aptitude.**

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4. **Adopt an interdisciplinary approach in learning**.

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5. **Make best use of the expertise of faculty across the Institution besides the particular department faculty.**

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4. Adopt an interdisciplinary approach in learning.
5. Make best use of the expertise of faculty across the Institution besides the particular department faculty.

6. Acquire knowledge, skill and attitude of learning outcomes through participatory teaching & learning and continuous evaluation process.

Semester System and Choice Based Credit System

- The Indian Higher Education Institutions HEIs have been moving from the conventional annual system to semester system.

- Currently many of the institutions have already introduced the choice based credit system.

- The semester system accelerates the teaching-learning process and enables vertical and horizontal mobility in learning.

- The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching.

- It is desirable that the HEIs move to CBCS and implement the grading system.

Types of Courses

Courses in a programme may be of three kinds:

- **Core,**
- **Elective and**
- **Foundation**

Core Course

- **There may be a Core Course in every semester.**

- **This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study**

Elective course

course which can be chosen from a pool of papers. It may be:

- **Supportive to the discipline of study**
- **Providing an expanded scope**
- **Enabling an exposure to some other discipline/ domain**
- **Nurturing student's proficiency/ skill.**

Elective course

- **An elective may be "Generic Elective" focusing on those courses which add generic proficiency to the students.**

- **An elective may be "Discipline centric" or may be chosen from an unrelated discipline. It may be called an "Open Elective."**

Foundation Course:-

- **Compulsory Foundation courses** are the courses based upon the content that leads to Knowledge enhancement. They are mandatory for all disciplines.
- Physics and Maths for BTech
- **Elective Foundation courses** are value-based and are aimed at man-making education.
- FCPC

Credits

- Credit: A unit by which the course work is measured.

- It determines the number of hours of instructions required per week.

- **One credit** is equivalent to

- One hour of teaching(lecture or tutorial) or

- Two hours of practical work/field work per week.

Credits

Generally it is conventional to assigned

- 4 credits to six hour course per week
- 3 credits to four / five hour course per week
- 2 credits to two hour course per week
- 1 credit to two hour Lab work per week
- The total minimum credits, required for completing a UG program is
- 120 in six semester course and
- 150 in eight semester course.

Credits

Generally it is conventional to assigned

- **Compulsory Courses = 4 credits per course**

- **Core / Special Courses = 3 credits per course**

- **Applied Components = 3 credits per course**

- **Foundation Courses = 2 credits per course**

- **Skill Courses = 2 credits per course**

-

Credits

Generally it is conventional to assigned

- The total credit value shall be
- 120 credits for all UG programmes across the faculties of Science, Arts and Management
- 160* credits for B.Tech for all Engineering
- 80 credits for all PG programmes of 4 semester.

*AICTE Recommends 22 credit in each semester making it to 176 in B.Tech & 88 in M.Tech

Examination and Assessment

- **The HEIs are currently following various methods for examination and assessment suitable for the courses and programmes as approved by their respective statutory bodies such as AICTE**

- In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (sessional, end-semester etc.,) in a semester.

Examination and Assessment

- **Some of the HEIs convert these marks to letter grades based on absolute or relative grading system and award the grades.**

- **There is a marked variation across the colleges and universities in the number of grades, grade points, letter grades used, which creates difficulties in comparing students across the institutions.**

- **The UGC recommends the following system to be implemented in awarding the grades and CGPA under the credit based semester system.**

Letter Grades and Grade Points

i. **Two methods -relative grading or absolute grading–**

a) **The relative grading is based on the distribution (usually normal distribution) of marks obtained by all the students of the course and the grades are awarded based on a cut-off marks or percentile.**

b) **Under the absolute grading, the marks are converted to grades based on pre-determined class intervals. To implement the following grading system, the colleges and universities can use any one of the above methods.**

ii. **The UGC recommends a 10-point grading system with the following letter grades as given below:**

Letter Grades and Grade Points

- The UGC recommends a 10-point grading system with the following letter grades as given below:

Grades	Gr. Points	%	Marks 150
O (Outstanding)	10	90-100	135-150
A+ (Excellent)	9	75-89.9	112-134
A (Very Good)	8	60-74.9	90-111
B+ (Good)	7	55-59.9	82-89
B (Above Average)	6	50-55.9	75-81
C (Average)	5	45-49.9	67-74
P (Pass)(may differ)	4	35-44.9	52-66
F (Fail) Ab (Absent)	0	<35/40	<51/59

UGC suggests

- The statutory requirement for eligibility to enter as assistant professor in colleges and universities in the disciplines of arts, science, commerce etc., is a minimum average mark of 50% and 55% in relevant postgraduate degree respectively for reserved and general category. Hence, it is recommended that the cut-off marks for **grade B shall not be less than 50%** and for **grade B+, it should not be less than 55%** under the absolute grading system. Similarly cut-off marks shall be fixed for grade B and B+ based on the recommendation of the statutory bodies (AICTE, NCTE etc.,) of the relevant disciplines.

Letter Grades and Grade Points

- A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

- For non credit courses such as EVS and GP 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

- The Universities can decide on the grade or percentage of marks required to pass in a course and also the CGPA required to qualify for a degree taking into consideration the recommendations of the statutory professional councils such as AICTE, MCI, BCI, NCTE etc.,

Fairness in Assessment

- **Assessment is an integral part of system of education as it is instrumental in identifying and certifying the academic standards accomplished by a student and projecting them far and wide as an objective and impartial indicator of a student's performance. Thus, it becomes bounden duty of a University to ensure that it is carried out in fair manner.**

Fairness in Assessment

- **In this regard, UGC recommends the following system of checks and balances which would enable Universities effectively and fairly carry out the process of assessment and examination.**

Fairness in Assessment

- **At least 50% of core courses** offered in different programmes across the disciplines, the assessment of the theoretical component towards the end of the semester should be undertaken **by external examiners** from outside the university conducting examination.

- In such courses, the question papers will be set as well as assessed by external examiners.

Fairness in Assessment

- In case of the assessment of practical component of such core courses, the team of examiners should be constituted on 50:50 basis.

- i.e. **half of the examiners in the team should be invited from outside the university conducting examination**.

- In case of the assessment of project reports / thesis / dissertation etc. **the evaluation work should be undertaken by internal as well as external examiners.**

Credit Weighed Marking System: Performance Evaluation (SGPA)

- Two ways for performance indices are

- **Semester Grade Point Average (SGPA) for the current semester** which is calculated on the basis grade points obtained in all courses,

- A=Σ(course credits earned x Grade points)

- B=Σ(Total course credits in the semester)

- **SGPA= A /B**

Credit Weighed Marking System: Performance Evaluation (SGPA)

- Two ways for performance indices are
- **Cummulative Grade Point Average (CGPA)** is calculated on the basis of all pass grades obtained in all completed semesters
- A= Σ(course credits earned x Grade points) over all semesters
- B=Σ(Total course credits) in all the semesters
- CGPA=A /B

Illustration for SGPA

Course	Credit	Grade letter	Grade point	Credit Point Credit x Grade	%
Course 1	3	A	8	3 X 8 = 24	75
Course 2	4	B+	7	4 X 7 = 28	64
Course 3	3	B	6	3 X 6 = 18	55
Course 4	3	O	10	3 X 10 = 30	92
Course 5	3	C	5	3 X 5 = 15	47
Course 6	4	B	6	4 X 6 = 24	52
	20			139	AV.64
Thus, **SGPA =139/20 =6.95**					

Illustration for CGPA

Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6
Credit : 20	Credit : 22	Credit : 25	Credit : 26	Credit : 26	Credit : 25
SGPA: 6.9	SGPA: 7.8	SGPA: 5.6	SGPA: 6.0	SGPA: 6.3	SGPA: 8.0

Thus, $\mathbf{CGPA} = \dfrac{20 \times 6.9 + 22 \times 7.8 + 25 \times 5.6 + 26 \times 6.0 + 26 \times 6.3 + 25 \times 8.0}{144} = \mathbf{6.73}$

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the DMC.

SCHEME OF EVALUATIONS

- The performance of the student shall be evaluated in two parts

- Internal assessment with 40% marks by way of continuous evaluation and

- by semester end assessment with 60% marks by conducting the theory examination.

SCHEME OF EVALUATIONS

- I. Internal Assessment:- It is defined as the assessment of the student **on the basis of continuous evaluation** by way of participation of learners in various academic and correlated activities in the given semester of the programme.

- II. Semester End Assessment:- It is defined as the assessment of the student on the basis of performance in the semester end theory / **written** examinations.

Evaluation (Calculation of Raw Score)

- **Marks Distribution for evaluation with following credits & Marks for a Theory course/paper**
  - **Course credits 4**
  - **Total Marks 150 (** it is suggested only**)**
  - **Distribution 40:60 (during semester: End semester exam)**
- **End Semester Exam(2½hrs): 90 marks (60%)**
- **Internal Marks 60 marks (40%)**
  - **Sessional Tests 1 & 2: 30 marks or 20 %**
  - **Assignments / Class test/presentation/discussion: 15 marks or 10%**
  - **Attendance: 15 marks or 10%**

Evaluation (Calculation of Raw Score)

- Credits and Marks Distribution for evaluation of practical
  - **Course credits 2 – Total Marks 100**
  - **Distribution 60:40 (during semester: End semester exam)**
- **Internal Marks 60 marks or 60 % (**for semester evaluations)
- **Record Mark :20 marks or 20 %**
- (based on continuous assessment of lab /practical works considering regularity and timely submission of lab/practice records)
- **Viva Voce** 30 marks or 30%
- **Attendance**: 10 marks or 10%
- **End Semester Practical Exam 40 marks or 40 %**
- (Lab Experiment/Procedure writing/Tabulation of readings etc/innovationetc. as applicable): **20 marks or 20%**
- **Viva Voce: 20 marks or 20%**

SCHEME OF EVALUATIONS

Semester End Assessment 60 % *90 Marks*

Duration – These examinations shall be of 2 or 2½ Hours duration.

Question Paper Pattern (to be decided by Schools)

1) **Question One of MCQ/short answer type covering full syllabus of the marks 18**

2) **There shall be four more compulsory questions from each units with internal choice within the questions. each of 18 marks.**

3) **Question may be sub-divided into sub-questions a, b & c only and the allocation of marks depends on the weightage of the topic.**

STANDARD OF PASSING

- **The students shall have to obtain a minimum of 40% marks in aggregate to qualify each course where the course consists of Internal Assessment & Semester End Examination.**

- **However, the students shall obtain minimum of 40% marks in the Internal Assessment and in Semester End Examination separately.**

- **To qualify each course minimum grade P shall be obtained by the student in each course and project wherever applicable in a particular semester.**

Internal Assessment

- A student who passes in the Internal Assessment but fails in the Semester End Examination of the Course shall reappear for the Semester End Examination of that Course.

- However, his/her marks of the Internal assessment shall be carried over and he/she shall be entitled for grade obtained by him/her on passing of the complete course.

- **A student who fails in the Internal Assessment and also fails in the Semester End Examination of the Course shall repeat that Course for the Semester ???**

Internal Assessment

- A Student who **fails** in the Internal Assessment but **passes** in the Semester End Examination of the course shall submit and reappear for the Internal assessment in the form of projects for that course.

- However, his/her marks of the Semester End Examination shall be carried over and he/she shall be entitled for grade obtained by him/her on qualifying the course.

- The Evaluation for students who fails in Internal Assessment will consist of one project of 40 marks which will be divided into 20 marks for the documentation of the project given by the concerned teachers on the curriculum, 10 marks each for the presentation and for the viva. **Pass marks is 16 out of 40.**

Promotion to next semester

- A student shall be allowed to move on to next even semester irrespective of number of failure in the odd Semester that is

- From semester I to Semester II

- From semester III to Semester IV

- From semester V to Semester VI

- From semester VII to Semester VIII

Promotion to next semester
(each School to decide separately)

- **However, a student shall be allowed to move on to next odd semester of new academic session that is**

- **Semester II to Semester III**

- **If he/she passes 50% of all papers of Semester I and Semester II** (Engg school may bypass this)

- **Semester IV to Semester V**

- **If he/she passes 50% of all papers of Semester I II,III and IV**

- **Semester VI to Semester VII**

- **If he/she passes Semester I and Semester II and 50% of all papers of Semester III, IV, V and VI**

- **COE will provide a chance to clear all papers in Even End Semester Examination**

Additional Exam in July ?

- **Semester End Examinations**
- There will be one additional examination for all semester for those who have failed or remained absent.
- The absent student will be allowed to appear for the examination by the head of the institution after following the necessary formalities.
- This examination will be held with in a month after the declaration of results.

How to introduce CBCS?

- Preparation of guidelines

- Preparations of Regulations and Course Structure for different levels by respective deans

- Formulation of subject wise working groups (to be constituted by the chairperson board of studies of different subjects)

- Sensitization of working group members and BOS members about the guide lines

How to introduce CBCS?

- Drafting of list of courses and their classification by subject wise working groups as per respective regulation.

- Drafting of list of courses and their classification across the school to be coordinated by the deans of the school with Chairperson BOS of the subject working groups to avoid any confusion

- Working groups prepare draft syllabus with volume of the content as per the credits requirement along with notes for paper setter etc.

How to introduce CBCS?

The drafting of the syllabus/ curricula is to be carried out in terms of

– Current knowledge

– National and international developments

– Relevance of new ideas, concepts and knowledge to the concerned discipline

– Internet search, latest books, journals and open course wares available across the net.

– Development of topical courses as per the requirements of employability of the learners, academic interests of the faculty and thrust of the programme.

- Volume of the content as per credits.

How to introduce CBCS?

- Subject wise workshops to discuss draft syllabi for different levels and make changes as per recommendations emerging from the discussion in workshops

- BOS meets to discuss draft syllabus along with regulations, make changes if required. finalise and approve these.

How to introduce CBCS?

Role of Working Groups/ Board of Studies of a subject (an example of B.Tech)

– **Focus on the structure of the programme as per the requirement of the award of degree with in a minimum period of four years & regulations.**

– **Identify courses as per the table on course wise distribution of credits and classification (Hard core, soft core, electives, open electives etc.) and total credit requirement.**

– **Design each course content to provide for stipulated instruction hours as is envisaged by the credits assigned to the course**

How to introduce CBCS?

- Role of Working Groups/ Board of Studies of a subject (an example of B.Tech)
    - **Design each course content to be spread evenly over the semester making necessary allowance for sessional tests, assignments, seminars etc.**
    - **Design course content so that it gets divided into four units with two chapters**
    - **Prepare Scheme of study**
    - **In the syllabus list recommended text books, list of supplementary reading and list of internet resources should be clearly mentioned.**

BOS

- The BOS shall make changes, if any, in the syllabus **at least a year** before the commencement of the academic year/ semester to which syllabus concerned pertains
- After the design of the syllabus, BOS shall check the model question papers
- Write the learning goals of the course and
- instructional objectives of each topic.

Teacher

- **Maintenance of complete course file** by teacher to be handed over to the designated head of Department having following documents
  - **Time table for the course**
  - **Learning goals of the course**
  - **Lecture wise course plan with learning/instructional objectives**
  - **Attendance record**
  - **Tutorial sheets/Assignment sheets**

Teacher

- **Quizzes**
- **Question papers of sessional tests**
- **Question paper of end semester examination**
- **Complete details of Comprehensive Continuous Assessment CCA**
- **Filled Teacher Evaluation Sheets by students**
- **Course Content Evaluation Sheets and feedback by students**
- **Marks of CCA of students with authenticated copy submitted to head of the department**

Labelling of Courses, Distribution of Courses and Management of Courses

- Different courses of study are labeled and earned as follows:
- – **Core Course:**
- A course which should be compulsorily be studied as a core-requirement is termed as a core course, some times it is also referred to as hard core course
- – **Soft Core/ Allied Core:**
- **A core course may be a soft core if** there is a choice or an option for the candidate to choose from a pool of courses from the main discipline/subject of study (also termed major) or from a sister/related discipline/ subject which supports the main discipline/subject

Labelling of Courses, Distribution of Courses and Management of Courses

- – **Elective Course:**

- **Generally a course which can be chosen** from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/subject of study or which provides an extended scope or which enables an exposure to some other discipline/ subject/ domain or nurtures the candidates proficiency/ skill is called an elective course. Elective courses may be offered by the main discipline/ subject of study

Labelling of Courses, Distribution of Courses and Management of Courses

- – **Open Elective:**

- **An elective course chosen generally from** an unrelated discipline/subject, with an intention to seek exposure is called an open elective

- – **Self Study Elective:**

- An elective course designed to acquire a special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher is called a self study elective.

Labelling of Courses, Distribution of Courses and Management of Courses

- – **Audit Course: A student has an option of auditing some courses,** grades obtained in such a course are not counted towards the calculation of grade point average. However, a Pass grade is essential for earning credits for an audit course.

- – **Project Work: Project work/ Dissertation work is a special course**

- involving application of knowledge in solving/analyzing/ exploring a real life situation/difficult problem.

- • Minor Project work (6-8 credits)

- • Major Project work (10-12 credits)

ELECTIVE PAPERS	
Mathematics	1. Operations Research 2. Programming in C for Numerical Methods 3. Astronomy 4. Mathematical Modeling
Physics	1. Energy Physics 2. Molecular Bio Physics 3. Spectroscopy & Laser Physics Integrated Electronics
Applied Physics	1. Communication Electronics 2. Biomedical Instrumentation 3. Electrical Machines 4. Material Technology
Chemistry	1. Analytical Chemistry 2. Agricultural Chemistry 3. Polymer Chemistry 4. Industrial Chemistry
Geology	1.Hydrogeology and Engineering Geology 2. Environmental Geology and Marine Geology 3. Geoexploration 4. Remote Sensing GIS and Mining

ELECTIVE PAPERS

Geography	1. Biogeography 2. Remote Sensing and GIS 3. Physical Geography for Competitive Examination 4. Social Geography for Competitive Examination
Statistics	.1. Biostatistics 2. Elementary Descriptive Statistics 3. Statistical Methods 4. Operational Research Methods
Computer Science	. Programming Laboratory (JAWA) 2. Fundamentals of Information Technology 3. Programming Laboratory (C++) 4. Basics of Computer Programming 5. MS office
Electronics	1. Electronics in Communication 2. Computer Hardware 3. Biomedical Instrumentation 4. Radio & Television
Industrial Electronics	Basics of VLSI Semiconductors' Technology Instrumentations bio-medicals

EC: Scheme of Instruction-Summary

S. No.	Course Work – Subject Area	Credits/Semester I IV	II	III		Credits/Semester V VIII	VI	VII		Credits-Total
1	Humanities and Social Sciences (HS)	6	8	-	-	-	-	-	-	14
2	Basic Sciences (BS)	7	6	6	7	4	2	-	-	32
3	Engineering Sciences (ES)	9	8	6	1	3	-	-	-	27
4	Professional Subjects-Core (EC)	-	- 14	10		12	14	-	-	50
5	Professional Subjects–Electives (EC*, EC^)	-	-	-	-	3	6	12	-	21
6	Open Subjects- Electives (OE)	-	-	-	-	-	-	6	6	12
7	Project Work, Seminar and/or Internship (ECP)	-	-	-	-	-	-	4	16	20
	TOTAL	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**176**
8	Mandatory Courses (MC) (Non-Credit)	3	3	3	-	-	-	-	-	9

ME: Scheme of Instruction-Summary

S. No.	Course Work - Subject Area	Credits/Semester				Credits/Semester				Credits-Total
		I	II	III	IV	V	VI	VII	VIII	
1	Humanities and Social Sciences (HS)	6	8	-	-	-	-	-	-	14
2	Basic Sciences(BS)	7	6	9	4	4	2	-	-	32
3	Engineering Sciences (ES)	9	8	13	1	-	-	-	-	31
4	Professional Subjects-Core (ME)	-	-	-	17	15	14	-	-	46
5	Professional Subjects–Electives (ME*, EC^, ME+.MEx)	-	-	-	-	3	6	12	-	21
6	Open Subjects- Electives (OE)	-	-	-	-	-	-	6	6	12
7	Project Work, Seminar and/or Internship	-	-	-	-	-	-	4	16	20
	TOTAL	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**176**
8	Mandatory Courses(MC)(Non-Credit)	3	3	3	-	-	-	-	-	9

(a) Humanities and Social Sciences *(HS)*

S. No.	Course Code	Course Title	Hrs/Wk L: T: P	Credits	Preferred Semester
1	HS 01	Sociology & Elements of Indian History for Engineers	3: 0: 0	3	I/II
2	HS 02	Economics for Engineers	3: 0: 0	3	I/II
3	HS 03	Law for Engineers	3: 0: 0	3	I/II
4	HS 04	Business Communication and Presentation Skills	2: 2: 4	5	I/II
5	HS 05	Environmental Sciences	1: 0: 2	2	I/II

(b) Basic Sciences (BS)

S. No.	Course Code	Course Title	Hrs/Wk L: T: P	Credits	Preferred Semester
1	BS 01	Elementary Mathematics for Engineers	2: 0: 0	2	I
2	BS 02	Multivariate Analysis, Linear Algebra and Special Functions	3: 0: 0	3	III
3	BS 03	Differential Equations	3: 0: 0	3	II
4	BS 04	Complex Analysis	2: 0: 0	2	IV
5	BS 05	Optimization and Calculus of Variations	2: 0: 0	2	III
6	BS 06	Probability and Statistics	2: 0: 0	2	IV
7	BS 07	Discrete Mathematics	2: 0: 0	2	V
8	BS 08	Fuzzy Mathematics	2: 0: 0	2	VI
9	BS 09	Applied Physics I	2: 0: 0	2	I
10	BS 10	Applied Physics II	2: 0: 0	2	II
11	BS 11	Applied Physics Laboratory I	0: 0: 2	1	I
12	BS 12	Applied Physics III	2: 0: 0	2	III

9	BS 09	Applied Physics I	2: 0: 0	2	I
10	BS 10	Applied Physics II	2: 0: 0	2	II
11	BS 11	Applied Physics Laboratory I	0: 0: 2	1	I
12	BS 12	Applied Physics III	2: 0: 0	2	III
13	BS 13	Applied Physics Laboratory II	0: 0: 2	1	II
14	BS 14	Chemistry I	2: 0: 0	2	I
15	BS 15	Chemistry Laboratory I	0: 0: 2	1	I/II
16	BS 16	Chemistry II	3: 0: 0	3	II/III
17	BS 17	Elementary Biology	1: 0: 2	2	I
18	BS 18	Advanced Biology I	1: 0: 2	2	II
19	BS 19	Advanced Biology II	1: 0 :2	2	III

(e) Open Electives (OE):

S. No.	Course No.	Course Title	Hrs/Wk L: T: P	Credits	Preferred Semester
1	OE 01	Database Management Systems	3: 0: 2	4	V/VI
2	OE 02	Software Engineering	3: 0: 0	3	V/VI
3	OE 03	Design and Analysis of Algorithms	3: 0: 0	3	V/VI
4	OE 04	Disaster Management	3: 0: 0	3	IV/V
5	OE 05	Project Management	3: 0: 0	3	IV/V
6	OE 06	Engineering Risk–Benefit Analysis	3: 0: 0	3	VI/VII
7	OE 07	Infrastructure Systems Planning	3: 0: 0	3	VI/VII
8	OE 08	Planning for Sustainable Development	3: 0: 0	3	VI/VII
9	OE 09	Managing Innovation and Entrepreneurship	3: 0: 0	3	VI/VII
10	OE 10	Global Strategy and Technology	3: 0: 0	3	VI/VII
11	OE 11	Knowledge Management	3: 0: 0	3	VI/VII
12	OE 12	Rural Technology & Community Development	3: 0: 0	3	Vi/VII
13	OE 13	Artificial Intelligence and Robotics	3: 0: 0	3	VI/VII
14	OE 14	Cloud Computing	3: 0: 0	3	VI/VII
15	OE 15	Digital Communication	3: 0: 0	3	VI/VII
16	OE 16	Digital Signal Processing	3: 0: 0	3	VI/VII
17	OE 17	Engineering System Analysis and Design	3: 0: 0	3	VII/VIII
18	OE 18	Engineering System Design	3: 0: 0	3	VII/VIII

(c) Engineering Sciences *(ES)*

S. No.	Course Code	Course Title	Hrs/Wk L: T: P	Credits	Preferred Semester
1	ES 01	Engineering Graphics	2: 2: 0	3	I
2	ES 02	Engineering Workshop	0: 0: 6	3	I
3	ES 03	Materials Science	2: 0: 0	2	III
4	ES 04	Basic Engineering Mechanics	2: 2: 0	3	I
5	ES 05	Basic Electrical Engineering	3: 0: 0	3	II
6	ES 06	Basic Electrical Engineering Laboratory	0: 0: 2	1	II
7	ES 07	Basic Electronics Engineering	3: 0: 0	3	III
8	ES 08	Basic Electronics Engineering Laboratory	0: 0: 2	1	III
9	ES 09	Computer Programming	2: 0: 0	2	II
10	ES 10	Computer Programming Laboratory	0: 0: 4	2	II
11	ES 11	Basic Simulation Laboratory	0: 0: 2	1	III
12	ES 12	Bassic Thermodynamics	3: 0: 0	3	IV
13	ES 13	Solid Mechanics & Fluid Mechanics	3: 0: 0	3	IV
14	ES 14	Solid Mechanics & Fluid Mechanics Laboratory	0: 0: 2	1	IV
15	ES 15	Engineering Mechanics	2: 2: 0	3	I/II
16	ES 16	Solid Mechanics	3: 0: 2	4	III/IV
17	ES 17	Thermodynamics	2: 2: 0	3	III/IV
18	ES 18	Engineering Materials	2: 0: 0	2	III/IV

(f) Mandatory Courses (MC):

S. No.	Course No.	Course Title	Hrs/Wk L: T: P	Units	Preferred Semester
1	MC 01	Technical English	3: 0: 0	3	I/II
2	MC 02	Value Education, Human Rights and Legislative Procedures	3: 0: 0	3	I/II
3	MC 03	Environmental Studies	3: 0: 0	3	III/IV
4	MC 04	Energy Studies	3: 0: 0	3	III/IV
5	MC 05	Technical Communication & Soft Skills	3: 0: 0	3	V/VI
6	MC 06	Foreign Language	3: 0: 0	3	V/VI

COURSE WISE CREDIT ASSIGNMENTS UNDER THE FACULTY OF COMMERCE

Type of Courses / Credits Assigned	First Year (Credit x No. of Courses)		Second Year (Credit x No. of Courses)		Third Year (Credit x No. of Courses)		Total Credit Value
	First Semester	Second Semester	Third Semester	Fourth Semester	Fifth Semester	Sixth Semester	
Core Courses	03 x 03	03 x 03	03 x 03	03 x 03	04 x 02	04 x 02	52
Allied Courses	03 x 03	03 x 03	03 x 01	03 x 01	---	---	24
Foundation Course	02 x 01	02 x 01	02 x 01	02x 01	---	---	08
Core / Special Courses	---	---	---	---	03 x 03	03 x 03	18
Applied Component Courses	---	---	03 x 01	03 x 01	03 x 02	03 x 02	18
Total	20	20	17	17	23	23	120

COURSE WISE CREDIT ASSIGNMENTS UNDER THE FACULTY OF SCIENCE

Type of Courses / Credits Assigned	First Year (Credit x No. of Courses)		Second Year (Credit x No. of Courses)		Third Year (Credit x No. of Courses)		Total Credit Value
	First Semester	Second Semester	Third Semester	Fourth Semester	Fifth Semester	Sixth Semester	
Core Courses (Theory)	04 x 03	04 x 03	06 x 02	06 x 02	2.5 x 04	2.5 x 04	68
Core Courses (Practical)	02x 03	02x 03	03 x 02	03 x 02	1.5 x 04	1.5 x 04	36
Foundation Course	02 x 01	02 x 01	02 x 01	02x 01	---	---	08
Applied Component Courses (Theory)	---	---	---	---	02 x 01	02 x 01	04
Applied Component Courses (Practical)	---	---	---	---	02 x 01	02 x 01	04
Total	20	20	20	20	20	20	120

Final Remarks

- CBCS is the mother of student centric educational reforms. A student is provided with an academically rich, highly flexible learning system blended with abundant provision for skill practice and activity orientation that he/she could learn in depth without sacrificing his/her creativity.

Final Remarks

- A student can exercise the option to decide his/her own pace of learning- slow, normal or accelerated plan and sequence his/her choice of paper, learn to face challenges through term work/ project work/ and may venture out to acquire extra knowledge/ proficiency through add- on facilities.

THANK YOU

Prof (Dr)Anil Kumar