



Solapur University, Solapur

Choice Based Credit system for UG Programmes

Faculty of Engineering & Technology

(Architecture/Engineering/Pharmacy)

1. Preamble

Solapur University has decided to implement choice based credit system (CBCS) system for all UG programmes from the academic year 2014-15. Accordingly Solapur University has introduced CGPA system to the First year of degree programme in engineering from the academic year 2014-15. Subsequently CGPA system will be introduced to Second year, Third year & Fourth year of degree engineering programmes in 2015-16, 2016-17 & 2017-18 respectively.

2. Course Curriculum

UG programmes under the Faculty of Engineering & Technology are from Engineering, Pharmacy & Architecture. Every programme with specialization has a prescribed course structure which in general terms is known as Curriculum. It prescribes number of courses to be studied in each semester. The booklet containing course structure along with detail syllabus for each course of each programme is updated periodically and is uploaded on the Website of Solapur University www.su.digitaluniversity.ac

a. Course Structure :

The structure and syllabi for all UG programmes under Faculty of Engineering & Technology offered by the university are available on the University website.

- **Composition of Course Curriculum:** - The University has maintained a critical balance and sufficient representation of Humanities and Social Sciences (HSS) courses, basic Sciences and Mathematics (S&M), Engineering and Technology / Pharmacy / Architecture courses in the curriculum.
- **Course Credit:**

In general, certain quantum of work measured in terms of credits is laid down as the requirement for a particular programme. Calculation of number of credits for a course in any semester is as per **Table-A** as given below.

Table A- Calculation of Credits

Sr. No.	Course	Credits
1	Lecture of 1 hour/week	1
2	Tutorial of 1 hour/week	1
3	Practical/Laboratory / Drawing/Project Work of two hours/week	1
4	Seminar of 1 hr/week	1



There are mainly two types of courses- viz. Theory courses and Laboratory courses. Generally a theory course consists of Lecture hours (L) and/or Tutorial hours (T). Tutorial hours may not be assigned to a particular theory course. Laboratory course consists of practical hours (P) for which a student works in a Laboratory or in Computer Center. Drawing course consists of drawing practical hours (P). The other courses required to be taken by a student include seminar, mini-project and project as the case may be.

Credits are awarded to a student for a course only if he/she satisfies the minimum attendance and evaluation requirements. No credits are awarded if a student satisfies the minimum attendance requirements but fails to acquire the minimum evaluation requirements.

The minimum number of credits required for completing the UG programme shall be **175**. The exact number of credits required to be completed for various UG programmes shall be as mentioned in the structure of the respective UG programme, but in any case it shall not be less than **175**.

Minimum no of credits required to be completed for each academic year of 4 years UG programme shall be as mentioned in the Table B.

Table B - General U.G. Programme Structure

<i>Year</i>	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Forth</i>
Minimum Credits	45	45	45	45

Those students, seeking direct admission to Second year of four years UG degree programme will be exempted to complete credits required for its first year.

b. Phases of Study

The curriculum is carefully designed to impart the necessary knowledge of Engineering & Technology / Architecture / Pharmacy as well as social sciences to prepare a competent global citizen. The three phases are as under:-

Phase I – Intense study of basic science, humanities and mathematics

Phase II – Study of Engineering & Technology / Architecture / Pharmacy

Phase III – Exposure to Applied areas in chosen programme of study

c. Objectives of various UG programmes, courses and their implementation details

For every programme, Programme Educational Objectives (PEO) and Programme Outcomes (POs) are defined by the respective Boards of Studies. PEOs are the broad statements that describe the career and professional accomplishments that the programme is preparing the graduates to achieve and POs are narrower statements that describe what students are expected to know and be able to do by the time of graduation.



For all courses, objectives and outcomes are defined. It is ensured that the course objectives and outcomes are in synchronization with the POs to meet PEOs

I. General Proficiency Courses (GP)

University offers General proficiency courses. The objectives are:-

- Improve the overall personality of the student
- Inculcate other personality traits such as street smartness, communication skills and general awareness etc.
- Introduce courses which complements Engineering learning
- Release mental stress
- Contribute to social issues through self learning

II. Skill Development Courses (SD)

Skill Development courses are offered with an objective to enhance the analytical and psychometric skills of the students as per current industrial trends.

III. Professional Development Courses (PD)

Professional Development courses are offered during the undergraduate matriculation with an objective to bridge the gap between industry & institute and to study subjects as per current industrial trends.

IV. Open Elective Courses (OE)

To supplement the technical knowledge in the field of engineering and to prepare a responsible citizen, courses such as Sociology, Psychology, Philosophy and Environmental Studies are also offered. The business knowledge essential for the engineer is also provided through courses like Economics, Management Techniques.

V. Mini-Project Course (MP)

The objectives behind the Mini Project are:

- Scope for creativity
- Hands on experience
- Academic occupancy
- Group Activity

VI. Seminar Course (SM)

Every student need to deliver a seminar based upon technical topic as a part of curriculum. The objectives behind this technical seminar are:-

- To inculcate the reference search and effective technical précis writing skills among students
- To enhance time management and presentation skills
- To strengthen the literature survey and other research attributes essential for major project activity



VII. Major Project Course (MP)

Project based learning is a paradigm which is becoming time-honored now a days. To keep abreast with this, Project course is included in the curriculum which is spread over both semesters of final year. For this course students carry out a project as a team that allows them to demonstrate their abilities and to develop skills within their chosen area of interest.

Below are some of the objectives for Major Project Course-

- To expose student to different project life cycle phases and project management skills
- To impart on student hands on experience for design & development of the project
- To enhance amongst student team working and leadership skills
- To enhance amongst student presentation and technical documentation skills.

3. Assessment and Examination

I. Formative Assessment

University has designed an assessment scheme that ensures regular studies during the course of semester. This formative assessment mechanism is to ensure continuous Teaching – Learning Assessment.

Continuous assessment is carried out for theory courses as In Semester Evaluation (ISE). The ISE component focuses on the students' performance in Class Test based on Unit, Home Assignments on self study components.

For laboratory courses, the performances of each experiment are assessed on a weekly basis as Internal Continuous Assessment (ICA).

II. Summative Assessment

The overall comprehension of the theory course is assessed by means of the conventional End-Semester Examination (ESE) paper of 70% of total theory marks prescribed for various courses. Based on the nature of theory course, instead of setting up memory recall type questions, Bloom's Taxonomy guidelines are used and an appropriate paper which assess design, analysis, simulation, application, logic, reasoning, quantitative skills, abilities of student, etc. is set up. Such careful in-depth thinking and thorough preparation for the summative assessment is another unique academic feature of the university.

In laboratory courses, the overall skills are assessed at the end of the semester by setting up a practical oral examination (POE) or oral examination (OE) for the given course as the case may be in accordance with course structure.

III. Assessment of Theory Course

A student shall be evaluated with 30% weightage for his/her academic



performance in a theory course for In-Semester Evaluation (ISE) and with 70% weightage for End-Semester Examination (ESE) which is a University Examination.

a. Assessment of ISE for Theory course

For a typical theory course, the student earns an appropriate grade based on the marks scored during the course of the Semester. The formative and summative assessment components are combined to generate the total marks.

The formative and summative assessment components are combined to generate 30% weightage marks for In-Semester Evaluation (ISE).

The mode of In-Semester Evaluation (ISE) shall be decided from various assessment components mentioned in **Table-C** given hereunder and the same shall be announced by the Course Instructor at the beginning of the course.

Table C - Assessment components of Theory Courses- ISE Part

Sr. No.	Assessment Component	Max. Marks
<i>First Year</i>		
1	Minimum Two Tests & Mid-Term Written Test conducted & evaluated at Institute Level (Mandatory)	30
In-Semester Evaluation (ISE) Total		30
<i>Second, Third and Fourth Year</i>		
1	Tests & Mid-Term Written Test conducted & evaluated at Institute Level (Mandatory)	20
2	Teacher's Assessment based on One or more Appropriate Activities related to course curriculum and conducted & evaluated at institute level, which includes—, assignments, viva-voce, quizzes, subject seminars with report writing, field visit, subject mini project, application software training, case study with report writing.	10
In-Semester Evaluation (ISE) Total		30

Tutorials are carried out in a batch size of 15 for Third Year, Forth Year and 20 for First Year, Second Year to supplement the theory course and to ensure one to one interaction with the student. This exposure and informal interaction with the faculty boosts the students' confidence.



b. Assessment of ESE for Theory Course

ESE shall be University Examination generally of three or four hour's duration as mentioned in the course structure for each theory course carrying 70% weightage and shall be held as per the schedule declared by the university.

All examinations and evaluations shall be compulsory. Credits for a course shall be awarded only if the student satisfies evaluation criteria and acquire the necessary minimum grade.

Minimum performance of 40% in ISE and ESE separately shall be required to get the passing grade.

IV. Assessment of Laboratory Courses

The In Semester Continuous Assessment (ICA) is the formative mode used for assessment of performances in each laboratory assignment. Assessment out of 10 marks is carried out for each experiment.

The End-Semester assessment is carried out at the end of the semester by means of practical oral examination (POE) **or** oral examination (OE) conducted by University and appropriate to the nature of laboratory course in accordance with laboratory course structure.

V. Assessment of Tutorials –

The assessment of tutorial course shall be carried out as Internal Continuous Assessment (ICA) at institute level based on regular supervision of the student's work during tutorial sessions and the quality of his/her work as prescribed through tutorial books and his/her performance uniformly distributed throughout the semester.

VI. Assessment of Seminar

Student presents a technical seminar at the predefined semester as mentioned in the course structure. The Seminar progress is reviewed during the Mid-Semester Examination as per the academic calendar. For poor performing students identified by the examination panel, a second review is taken. In the reviews, the applicability and relevance of the topic, etc. is discussed. The seminar is presented at the end of the semester. The seminar evaluation scheme is as under. The marks shall be proportionally scaled down to require depending upon the marks assigned to Seminar in the course curriculum.



Table D - Assessment Components of Seminar - ICA

Sr.		Performance Indicator	Maximum Marks
1		Participation	
	1.a	Regular Attendance for all seminars	10
	1.b	Adherence to timelines	10
2		Quality of Presentation	
	2.a	Selection of Topic	05
	2.b	Literature Review & references to other work	05
	2.c	Technical Contents	10
	2.d	Organization	05
	2.e	Quality of slides	05
	2.f	Oral Skills	05
	2.g	Answers to extempore questions	05
3		Quality of Seminar Report	
	3.a	Literature Review	10
	3.b	Organization	05
	3.c	Writing Skills & Language	10
	3.d	Technical Content	15
		Total	100

VII. Assessment of Mini Project

Mini project is carried out, if specified in the programme structure by Group formation, discussion with faculty advisor, formation of the mini project statement, resource requirement identification and implementation of the mini project using laboratory resources is carried out systematically.

The student is evaluated for his/her mini-project through the quality of work carried out, the novelty in the concept, the report submitted and presentation(s) etc.

Based on the submitted Mini-Project report, Oral Presentation and demonstration before a panel of examiners at the end of the semester for the marks & nature as mentioned in the respective programme structure.

VIII. Assessment of Major Project

Project based learning is a paradigm which is becoming time-honored now a days. To keep abreast with this, Project course is included in the curriculum which is spread over both semesters of final year. For this course students carry out a project as a team that allows them to demonstrate their abilities and to develop skills within their chosen area of interest. The project work is carried out in two semesters of final year.

In semester –I, group will select a project with the approval of supervisor and submit the synopsis of the project. The group is expected to complete detail system design, high level design and low level design of project.

In semester II, group shall develop complete project and validate the results along with its detailed analysis. Also they shall come up with a detailed project report capturing design, implementation and outcome of each vital stage in project development life cycle.



The assessment of Project Stage I is an ICA and is as under. The marks shall be proportionally scaled down to require depending upon the marks assigned to Project Stage I in curriculum.

Table E - Assessment Components of Project (Semester I)

Sr.		<i>Performance Indicator</i>	<i>Maximum Marks</i>
1		Participation	
	1.a	Regular Attendance for all project activities	10
	1.b	Adherence to timelines	10
	1.c	Teamwork	10
2		Technical Work	
	2.a	Literature Review	10
	2.b	Problem Definition	10
	2.c	Requirement Analysis	10
	2.d	Project Planning	10
	2.e	Design	20
	2.f	Documentation	10
		Total	100

The assessment of Project Stage II consists of two parts ICA and ESE. The End Semester Examination will be a viva voce conducted by University at institution. The external examiner for this examination shall from industry or from engineering institute out of University Jurisdiction.

The internal continuous assessment (ICA) of Project Stage-II is as under. The marks shall be proportionally scaled to required number depending upon the marks assigned to Project Stage II ICA in curriculum.

Table F - Assessment Components of Project (Semester II) - ICA Part

Sr.		<i>Performance Indicator</i>	<i>Maximum Marks</i>
1		Participation	
	1.a	Regular Attendance for all project activities	10
	1.b	Adherence to timelines	10
	1.c	Teamwork	10
2		Technical Work	
	2.a	Project planning & its timely execution	10
	2.b	Realization of project design	20
	2.c	Results and its analysis	10
3		Quality of Project Report	
	3.a	Problem definition & requirement analysis	05
	3.b	Literature review	05
	3.c	Technical details	10
	3.d	Results, discussion & conclusion	05
	3.e	Writing Skills & Language	05
		Total	100



IX. Assessment of Vocational Training

Student shall complete Vocational Training for minimum no of days/weeks as prescribed in the course curriculum in any vacation/s after Second year semester II but before Final year semester I & the report shall be submitted and evaluated in Final year semester I. The assessment of the vocational training is done at institute level, is an ICA and shall be based upon the quality of the report submitted and viva voce conducted to evaluate the learning outcome of the student from vocational training.

X. Self Learning Courses:

Student shall select one Self Learning subject from Humanities and Social Science (HSS) Group at Third year semester I and one Self Learning subject from Technical Group or HSS group at Third year semester II in accordance with respective programmes course curriculum. The assessment of the both Self Learning Courses will be End Semester Examination (ESE) conducted by University

- The assessment details of various academic activities during programme are summarized in Table G below-

Table G- Summary of Assessment of various academic activities

Sr.	Activity	Execution Process	Assessed By	Remarks
1	ISE part of Theory Courses	Continuous	Institute	Please refer Table C
2	ESE part of Theory Courses	End Sem.	University	Theory Exam of 3 or 4 hours
3	ICA part of Lab Courses	Continuous	Institute	Based on performance of the student during all lab sessions
4	ESE part of Lab Courses	End Sem.	University	Practical Oral Exam (POE) OR Oral Exam (OE)
5	Tutorials - ICA	Continuous	Institute	Based on performance of the student during all tutorial sessions
6	Seminar- ICA	Continuous	Institute	Please refer Table D
7	Mini Project	ICA or ESE as per Curriculum Structure		
8	Major Project Sem I- ICA	Continuous	Institute	Please refer Table E
9	Major Project Sem II – ICA	Continuous	Institute	Please refer Table F
10	Major Project Sem II – ESE Part	End Sem.	University	Viva Voce by supervisor and examiner appointment by university from industry or out of University institute



Sr.	Activity	Execution Process	Assessed By	Remarks
11	Vocational Training - ICA	Any time during sem.	Institute	Based upon report & learning outcomes of training
12	Self Learning Courses	End Sem.	University	--

4. Admission and Registration

Admissions to the various Programmes are made as per the AICTE rules and regulations and as accepted by the DTE, Mumbai. Once a candidate is selected for UG Programme, he/she has to register for first year immediately. Registration is compulsory at the start of each year as per the schedule announced in the academic calendar.

I. Regular Entry:

Every student must register for the courses that he/she wants to study for earning credits at the beginning of academic year on the prescribed dates announced from time to time and shall be mandatory for every student till he/she completes the programme. Only after registration, student's name will appear in the roll list of each of such courses.

5. Attendance

- I. Regular 100% attendance is expected of all students for every course registered in theory, laboratory, seminar and project. Hence attendance is compulsory and shall be monitored in the semester rigorously. Students shall be informed at the end of every month if they are falling short of attendance requirement.
- II. A maximum of 25% absence for the attendance may be permitted only on valid grounds such as illness, death in family or other emergency reason which is beyond control of a student and shall be approved by the concerned affiliated institute.

6. Grading System

I. Award of Grade

- a. For every course registered by a student he/she shall be assigned a grade based on his/her combined performance in all components of evaluation scheme of a course as per the structure. The grade indicates an assessment of the student's performance and shall be associated with equivalent number called a grade point.
- b. The academic performance of a student shall be graded on a ten point scale. The letter grades, the guidelines for conversion of marks to letter grades and their equivalent grade points shall be as shown in Table-H.
- c. The combined performance mentioned in Clause 8(i)(a) refers to combined performance in ISE and ESE for theory courses while performance in ISE and ESE, if any for laboratory courses.



- d. A student shall pass the course if he/she gets any grade in the range from "O" to "C".

Table H -Conversion of Marks into Grades

Sr. No.	Range of Marks	Grade	Grade Point	Description of performance
1	80 onwards	O	10	Excellent/outstanding
2	70 – 79	A+	9	Very Good
3	60 – 69	A	8	Good
4	55 – 59	B+	7	Fair
5	50 – 54	B	6	Above average
6	45 – 49	C+	5	average
7	40 – 44	C	4	Below average
8	<40	F	0	Fail
9	-	XX	0	Detained
10	-	DR		Dropped Out

- II. Grade "XX" in a regular course shall be awarded to a student if he/she falls in any of the following categories.
- A student does not maintain the minimum 75% attendance in any of the theory or laboratory courses.
 - A student has not completed most of the ISE due to non- medical reasons (for example when a student has missed all or most of the components of internal evaluation conducted by the instructor in that semester).
 - The performance of a student is less than 40% in ISE.

III. Standard of Passing:

- The student has to secure a minimum 4.0 Grade Points (Grade C) in each course (subject/passing head). A student who secures less than 4.0 points will be declared Failed in that head of passing. A student who failed in ESE and passed in ISE shall be given **F** grade. Such students will have to appear for ESE only.
- For award of Degree in UG Programme, minimum CGPA must be 5.0 on completion of the UG programme.



7. Calculation of Performance Indices

Semester Grade Point Average (SGPA) represents the performance of a student in a semester for which it shall be computed while Cumulative Grade Point Average (CGPA) represents the performance of a student cumulated over all semesters upto and including the semester for which it is computed. Both performance indices shall be on a scale of 10.

I. Semester Grade Point Average (SGPA)

- a. The performance of a student in a semester shall be indicated by a number called SGPA.
- b. SGPA shall be the weighted average of the grade points obtained in all the courses registered by the student during the semester.
- c. If G_i is a grade with numerical equivalent as g_i obtained by a student for the course with credit C_i; then, SGPA for that semester shall be calculated using formula.

$$SGPA = \frac{\sum_i C_i g_i}{\sum_i C_i}$$

where summation is for all the courses registered by a student in that semester. SGPA shall be calculated and is rounded off to two decimal places.

- c. SGPA shall get affected because of the grades "XX" and "FF" obtained by the student in any of the courses.

II. Cumulative Grade Point Average (CGPA)

- a. An up-to-date assessment of the overall performance of a student for the courses from the first semester onwards till completion of the programme shall be obtained by calculating a number called CGPA.
- b. CGPA shall be the weighted average of the grade points obtained in all the courses registered by a student since the beginning of the first semester of the programme.

$$CGPA = \frac{\sum_i C_i g_i}{\sum_i C_i}$$

where summation shall be for all the courses registered by a student upto and including that semester. The CGPA shall be calculated at the end of every semester to two decimal places and shall be rounded off.

CGPA shall reflect all courses done by a student including courses where he/she has failed. Thus, similar to SGPA, "FF" grade and "XX" grade will affect the CGPA of a student.

- c. In case of a student clearing a failed course, failed grade would be replaced by the new passing grade in calculation of the CGPA.



8. Conversion of Average Grade Points into Grades

Table I below shows a conversion of average grade points into grade.

Table I- Conversion of Average Grade Points into Grades

SGPA/CGPA	Letter Grade
9.5 – 10	O
8.5 – 9.4	A+
7.5 – 8.4	A
6.5 – 7.4	B+
5.5 – 6.4	B
4.5 – 5.4	C+
4.0 – 4.4	C
< 3.9	F