CHOICE BASED CREDIT SYSTEM FOR PG COURSE (CAD/CAM) IN GONDWANA UNIVERSITY, GADCHIROLI
(WITH EFFECT FROM 2016-17)

1.0 **PRELIMINARY DEFINITIONS**

1.1 'Program' means Degree program like M.E., M. Tech. etc

1.2 'Specialization' means a discipline of the Post Graduate (Nomenclature P for Pg and U for UG) program like Energy Management Systems, CAD/ CAM, Structural Engineering, Electrical Power System, Computer Science Engineering, Electronics Engineering etc.

1.3 'Course' means a Theory or a Practical subject that is to be studies by a student in a Semester.

1.4 'Board' means Board of Studies at the University level.

2.0 STRUCTURE OF THE PROGRAM

2.1 Every Post Graduate Program in the Faculty of Engineering & Technology shall have a Scheme for Teaching & Examinations along with the Syllabi. The Subjects in a particular Course shall be categorized as follows :

- Foundation Courses (F) : This may include basic courses with relevant syllabus required for that particular specialization like Mathematics and so on.
- Professional Core Courses (C) : This shall include the core course relevant to a particular specialization and shall be compulsory for all the concerned students.
- Professional Elective (P) : This will be in the form of POOL of subjects offered to the students so as to suite their CHOICE. This may belong to the same BOARD or the other BOARD, however, in the same FACULTY of Engineering & Technology.
- Employability Enhancement Courses (E) : This will include Project Work/ Internship/ Seminar/ Professional Practices/ Case Study/ Industrial or Practical Training.

3.0 NUMBER OF COURSES PER SEMESTER AND CREDIT ASSIGNMENT

3.1 Curriculum of s semester shall have justified blend of theory and Practical subjects including Employability Enhancement Courses. The Courses shall have the credits as per pattern mentioned in next section below.

3.2 The credit shall be based on following common base :

Contact Hours / Week	Credit	
One Theory	1	**(The Contact Hours per week for Theory, Practical and Tutorial shall be only in the multiple of 2)**
One Tutorial	1	
Two Practical	1	

4.0   GENERAL RULES WHILE DESIGNING CURRICULUM & SYLLABI

4.1   The common format as provided shall be followed, as far as possible.

4.2   The number of subjects in each semester and their credits may be justifiably decided by the concerned BOS. However, the total credits (including in all four semesters) shall be same for all the specialization, in a faculty, as far as possible.

4.3   The first TWO semesters shall not have any inter Board of Studies/ inter Faculty subjects. However, it may have Professional ELECTIVES (Core) which are restricted to its parent Board of Studies only. (BOS)

4.4   The Practical subjects may be introduced as per requirement of the respective Board, restricted to the parent BOS itself only to which the specialization is attached

4.5   The 3rd / 4th Semesters may have subjects on Project/ Case Study/ Industrial Training/ Seminar/ self study papers etc.

4.6   Incentive Marks inclusion Technique   :   The SGPA of II and IV Semester shall be supplemented to provide weightage to the incentive marks sent by the College. The procedure shall be as mentioned below   :

- ▪ Let 'x' is the incentive marks allotted to a student. These marks shall be directly supplemented in a non-theory subject decided by the Faculty, subject to the condition that consequent total marks shall not be more than maximum marks in that particular non- theory subject Head. The SGPA shall be calculated as usually.

4.7   The failure students in present Credit Based System in the University shall have **THREE** last chances to pass examination in the earlier pattern, as mentioned below   :

FIRST SEMESTER	SECOND SEMESTER	THIRD SEMESTER	FOURTH SEMESTER
WIN-16, SUM-17, WINT-17	**WIN-16, SUM-17, WINT-17**	**WIN-16, SUM-17, WINT-17**	**WIN-16, SUM-17, WINT-17**

4.8   With effect from summer – 2018 examinations, all the failure students shall be absorbed in CBCS pattern, as per respective Equivalence Scheme.

4.9   The Equivalence scheme shall be submitted by the respective BOS so as to absorb students from Credit Based System to Choice Based Credit System.

5.0   MARKS TO GRADE AND GRADE EXPLANATION SCHEME

The Faculty shall decide the conversion of MARKS to equivalent GRADES in CBCS. The proposed format is mentioned below   :

% SCORE (x) in Theory	% SCORE (x) in Practical	Grade	Grade Points (on 10 point scale)	Grade
$80 \leq x \leq 100$	$85 \leq x \leq 100$	A+	10	OUTSTANDING
$70 \leq x \leq 79$	$80 \leq x \leq 84$	A	9	EXCELLENT
$60 \leq x \leq 69$	$75 \leq x \leq 79$	B+	8	VERY GOOD
$55 \leq x \leq 59$	$70 \leq x \leq 74$	B	7	GOOD
$50 \leq x \leq 54$	$65 \leq x \leq 69$	C+	6	FAIR
$45 \leq x \leq 49$	$60 \leq x \leq 64$	C	5	AVERAGE
$40 \leq x \leq 44$	$50 \leq x \leq 59$	D	4	PASS
$00 \leq x \leq 39$	$00 \leq x \leq 49$	F	0	FAIL
Absent in Examination	**Absent in Examination**	**Z**	**-**	**ABSENT**

6.0   GENERAL RULES

6.1   In Memo of Marks, the name of the subject with respect to the subject code shall be printed. This will be more important wherever optional subjects are there. Under such cases, the subject opted by the student (means filled by the student in examination form) only shall be printed. It is therefore, recommended that the examination form of CBCS should have provision to the fill the subject code very clearly, with clear 'SEVEN' columns, as the subject code is of six & seven Letters.

6.2   CGPA to percentage transformation shall be as per prevailing Direction only for '10' points scale.
6.3   ATKT shall be applicable as is in force in the respective Faculty.
6.4   The Marks secured by the Examinees shall NEVER be reflected in any Memo of Marks

7.0 TEACHING AND EXAMINATION SCHEME SPECIMEN

GONDWANA UNIVERSITY, GADCHIROLI
MASTER OF TECHNOLOGY IN CAD/CAM
(TWO YEARS COURSE IN FACULTY OF ENGINEERING & TECHNOLOGY)
COURSE AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

I – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme				Examination Scheme										
			Hours per week			No. of Credits	Theory						Practical				
			L	Field Work/ Assignment / Tutorial	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
									Sessional							
								ESE	MSE	IE			TW	PEE		
PCDS11	C	Data Structure & Algorithms	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS12	C	CNC & Robotics	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS13	C	Computer Graphics for CAD/CAM	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS14x	P	Elective - I	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
Laboratories/ Practical																
PCDS15	C	CAM Lab	-	-	2	1	3	-	-	-	-	-	25	25	**50**	25
PCDS16	E	Seminar - I	-	-	2	1	-	-	-	-	-	-	50	-	**50**	25
		TOTAL	12	08	4	18	-	**400**					**100**			
		SEMESTER TOTAL	**24**		**18**		**500**									

Elective – I (x) : (A)**Mechatronics** (B) **Total Quality Systems & Engineering**   (C) **Artificial Intelligence**

8.0   TEACHING AND EXAMINATION SCHEME SPECIMEN

GONDWANA UNIVERSITY, GADCHIROLI
MASTER OF TECHNOLOGY IN CAD/CAM
(TWO YEARS COURSE IN FACULTY OF ENGINEERING & TECHNOLOGY)
COURSE AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

II – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme				Examination Scheme										
			Hours per week			No. of Credits	Theory						Practical			
			L	Field Work/ Assignment/ Tutorial	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
									Sessional							
								ESE	MSE	IE			TW	PEE		
PCDS21	C	Computer Integrated Manufacturing System	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS22	C	Product Data Management	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS23	C	Finite Element Method	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS24x	P	Elective – II (x)	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
Laboratories/ Practical																
PCDS25	C	CAD Lab	-	-	2	1	-	-	-	-	-	-	25	25	**50**	25
PCDS26	E	Seminar - II	-	-	2	1	-	-	-	-	-	-	50	-	**50**	25
		TOTAL	12	08	4	18	-	400					100			
		SEMESTER TOTAL	24		18		500									

Elective –II (x) :**(A) Computational Fluid Dynamics (B) Product Design & Development (C) Computer Aided Tool Design**

9.0 TEACHING AND EXAMINATION SCHEME SPECIMEN

GONDWANA UNIVERSITY, GADCHIROLI
MASTER OF TECHNOLOGY IN CAD/CAM
(TWO YEARS COURSE IN FACULTY OF ENGINEERING & TECHNOLOGY)
COURSE AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

III – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme			No. of Credits	Examination Scheme										
			Hours per week				Theory						Practical				
			L	Field Work/ Assignment / Tutorial	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
									Sessional							
								ESE	MSE	IE			TW	PEE		
PCDS31	C	Self Study Course	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
PCDS32x	P	Elective - III	3	2	-	4	3	70	10	20	**100**	50	-	-	-	-
	Laboratories/ Practical															
PCDS33x	E	Grand Seminar / Industrial Training	-	10	-	5	-	-	-	-	-	-	100	-	**100**	50
PCDS34	E	Pre-Dissertation	-	10	-	5	-	-	-	-	-	-	200	-	**200**	100
		TOTAL	6	24	-	18	-	**200**					**300**			
		SEMESTER TOTAL	**30**			**18**	**500**									

Elective – III (x) : A)Pattern Recognition (BOS of Computer Science/Tech/Engg) B) Modeling and Simulation C) Soft Computing (BOS of Computer Science/Tech/Engg)

10.0   TEACHING AND EXAMINATION SCHEME SPECIMEN

GONDWANA UNIVERSITY, GADCHIROLI
MASTER OF TECHNOLOGY IN CAD/CAM
(TWO YEARS COURSE IN FACULTY OF ENGINEERING & TECHNOLOGY)
COURSE AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

IV – SEMESTER

Unique Subject Code (USC)	Course type	Subject	Teaching Scheme			No. of Credits	Examination Scheme									
			Hours per week				Theory						Practical			
			L	Field Work/ Assignment/ Tutorial	P		Duration of Paper (Hrs.)	Max Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
									Sessional							
								ESE	MSE	IE			TW	PEE		
PCDS41	E	Final Dissertation	-	24		18	-						250	250	500	250
		TOTAL		24		18	-							**550**		
		<mark>**SEMESTER TOTAL**</mark>		**24**		**18**					**500**					

CourseScheme					ExaminationScheme				
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total
03	02	-	-	04	03	10	20	70	100

Contents :

Foundation of Research : What is Research? ,Objectives of Research , Scientific Research , Research and Theory , Conceptual and theoretical Models , Importance of research methodology in scientific research

Types and Methods of Research : Classification of Research , Pure and Applied Research ,Exploring or Formulative Research, Descriptive Research, Diagnostic Research/Study, Evaluation research/Studies, Action Research,Experimental Research , Analytical Study of Statistical Method, Historical Research, Surveys, Case Study, Field Studies,

Review of Literature : Need for Reviewing Literature,What to Review and for what purpose, Literature Search Procedure, Sources of Literature, Planning of Review work, Note Taking, Library and documentation

Planning of Research : The planning process,Selection of a Problem for Research, Formulation of the Selected Problems, Hypothesis formation, Measurement

Research Design/Plan : Sampling, Sampling Techniques or Methods, Choice of sampling Techniques, Sample size , Sampling and Non-Sampling errors,Estimation of Population Proportion and Population Mean , Estimation of Standard Error and Confidence Interval

Methods of data collection: Meaning and Importance of Data , Sources of Data , Use of Secondary Data , Methods of Collecting Primary Data , Observation Method , Experimentation, Design of Experiments , Simulation ,

Tools for data collection : Types of Data , Construction of Schedules and Questionnaires , Measurement of Scales and Indices , Pilot Studies and Pre-tests, Experimental Data Sets, Check Sheet,

Field work : The Nature of Field Work , Selection and Training of Investigators , Sampling Frame and Sample Selection , Field Operation, Field Administration

Processing of Data : Editing , Classification and Coding , Transcription , Tabulation , Introduction to Statistical Software: MINITAB , Graphical Representation , Measures of Relationship, Simple Regression Analysis , Multiple Correlation and Regression, Partial Correlation

Statistical Analysis of Data: Statistical Analysis , Measures of Central Tendency , Measures of Dispersion , Measures of Association/Relationship, Probability distributions: Binomial, Poisson, Uniform, Normal and Exponential, Hypothesis Testing, Confidence Interval, Test of Significance, Comparison of Two Proportions, Comparison of Means(z test, t test, two sample t test, paired-t test), ANOVA, Non-parametric Methods

Report writing : Types of Reports, Planning of Report Writing, Research Report Format, Principles of Writing, Documentation, Data and Data Analysis Reporting in a Thesis, Writing of Report, Typing of Report, Briefing

Books/References:
1. Research Methodology: Methods and Techniques by C. R. Kothari, New Age International Publishers, ISBN:81-224-1522-9
2. Statistical Methods for Research Workers by Fisher R. A., Cosmo Publications, New Delhi ISBN:81-307-0128-6
3. Design and Analysis of Experiments by MontogomeryD.C. (2001), John Wiley, ISBN: 0471260088

4. Research Methods for Engineers, David V. Thiel, CambridgeUniversity Press
5. MINITAB online manual

NameoftheProgram :   IIISemesterM.Tech.(CAD/CAM)
CourseCode   :   PCDS321
CourseTitle   :   Elective – III Pattern Recognations

CourseScheme					ExaminationScheme				
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total
03	02	-	-	04	03	10	20	70	100

Contents

Introduction : Examples; The nature of statistical pattern recognition; Three learning paradigms; The subproblemsof pattern recognition; The basicsstructure of a pattern recognition system; Comparing classifiers. Learning – Parametric Approaches: Basic statistical issues; Sources of classification error; Bias and variance;Three approaches to classification: density estimation, regression and discriminant analysis; Empirical errorcriteria; Optimization methods; failure of MLE.Parametric Discriminant Functions: Linear and quadratic discriminants; Shrinkage; Logistic Classification;Generalized Liner classifiers; receptrons; Maximum Margin, Error Correcting Codes.Error Assessment: Sample error and true error; Error rate estimation; Confidence intervals, Resamplingmethods; Regularization; Model selection, Minimum description length; Comparing classifiers.Nonparametric Classification; Histograms rules; Nearest neighbor method, Kernel approaches, Localpolynomial fitting; Flexible metrics, Automatic Kernels methods.Feature Extraction: Optimal features; Optimal liner transformations; Liner and nonlinear principal components;Feature subset selection.

References

1. Pattern Recognition principles by Julus T. Tou and Rafel C. Gonzalez, Addision –Wesley PublishingCompany.

2. Pattern Recognition and Image Analysis by Earl Gose, Richard Johnsonbaugh, PrenticeHall of India Private Limited, 1999.

CourseScheme					ExaminationScheme				
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total
03	02	-	-	04	03	10	20	70	100

Contents

Introduction tosimulationasatool,Areasofapplication,Systemmodel,Components ofsystem,System environment,Typesofsystemmodel,Steps inasimulationstudy.

Discreteeventsystemsimulation, Eventscheduling,Timeadvance mechanism,Listprocessing-basicproperties andoperations,Dynamicallocation,linkedlines.

Characteristicsofqueuingsystems, Transientandsteady-statebehaviour,Long-runperformancemeasures, Infinite-populationsteady-statemodels,Finite-populationmodels.

Properties and generation of random numbers, Testing of generated random numbers. Random Variate Generation:Exponential,Uniform,Weibull,Triangular,Empirical,Discretedistributions,Directtransformation fornormaldistribution,Convolutionmethod,Acceptance-rejection technique,Datacollection,Identifying distributions,Parameterestimation, Goodness-of-fittests,Multivariateandtimeseriesinputmodels.
Modelbuilding,Verification,Validationprocess,Verificationofsimulationmodels,Calibrationandvalidation ofmodels:Validationofassumptions,Input-outputtransformations,Validationofinput-output using historical dataandturningtest.

Modelingmanufacturingsystems,Materialhandlingsystem,Goalsandperformancemeasures,Modelingdown timesand failures,Trace-drivenmodels,CasestudiesofmanufacturingandMaterial Handlingsystems.

Statisticalproceduresforcomparingrealworldobservationsandsimulationoutputdata.
Simulation Languages, introduction to SIMLIB, SIMAN, SIMSCRIPT, SLAM-II, Promodel, General description,Actiontimes,Successionofevents,Choiceofpaths,Simulation ofMfg.shop,Facilities&storages, Gatheringstatistics,Conditionaltransfers,Programcontrolstatements,GPSSexamples.

BooksforReference:
1.J.Banks"Discrete-EventSystemSimulation",PHI.
2.S.Law ,"SimulationModelingandAnalysis",McGrawHill PublishingCo.
3.N.Deo,"DiscreteSimulationusingDigital Computers".
4.J. Gordon,"SystemSimulation",PHI
5.A.M.Law&W.D.Keltron,"Simulation Modeling&Analysis",McGrawHill Internationalseries.
6.MikellP.Groover,"Automation,ProductionSystemsandComputerIntegratedManufacturing",Prentice

HallOfIndiaPvt.Ltd

NameoftheProgram	**:**	**III SemesterM.Tech.(CAD/CAM)**		
CourseCode	**:**	**PCDS323**		
CourseTitle	**:**	**Elective – III soft Computing**		

CourseScheme						ExaminationScheme				
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total
03	02	-	-	04	03	10	20	70	100

Contents

Artificial Neural Networks

Basic concepts - Single layer perception - Multilayer Perception - Supervised and Unsupervised learning – Backpropagation networks - Kohnen'sself organizing networks - Hopfield network. Fuzzy Systems, Fuzzy sets and Fuzzy reasoning - Fuzzy matrices - Fuzzy functions - Decomposition - Fuzzy automata andlanguages - Fuzzy control methods - Fuzzy decision making.

Neuro - Fuzzy Modeling, Adaptive networks based Fuzzy interface systems - Classification and Regression Trees - Data clusteringalgorithms - Rule based structure identification - Neuro-Fuzzy controls - Simulated annealing Evolutionarycomputation.Genetic Algorithms, Survival of the Fittest - Fitness Computations - Cross over - Mutation -Reproduction - Rank method –Rankspacemethod, Soft computing and Conventional AI search algorithm - Predicate calculus - Rules of interference – Semantic networks - Frames - Objects – Hybridmodels - Applications.

References

1. Jang J.S.R., Sun C.T. and Mizutani E, "Neuro - Fuzzy and Soft computing", Pearson Education 2003.

2. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, 1997.

3. LaureneFausett, "Fundamentals of Neural Networks", Pearson Education, 2003.

4. George J. Klir and Bo Yuan, "Fuzzy sets and Fuzzy Logic", Prentice Hall, USA 1995.

5. NihJ.Nelsson, "Artificial Intelligence - A New Synthesis", Harcourt Asia Ltd., 1998.

6. D.E. Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley,N.Y,

1989.

NameoftheProgram : IIISemesterM.Tech.(CAD/CAM)
CourseCode : PCDS33
CourseTitle : Grand Seminar

CourseScheme					ExaminationScheme								
						Theory				Practical			
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total	Max. Marks	TW	PPE	Min. Passing Marks
-	10	-	-	5	-	-	-	-	-	100	100	-	50

Contents :

      Admitted candidates are required to deliver a seminar on any topic based on all courses of First and Second Semester of the program Further that the selected topic will be other than topic/area of study selected for the Dissertation during third and fourth semester. Candidate is required to submit the report with minimum 40 pages for the final evaluation.

NameoftheProgram : IIISemesterM.Tech.(CAD/CAM)
CourseCode : PCDS34
CourseTitle : Pre Dissertation Seminar

CourseScheme					ExaminationScheme								
						Theory				Practical			
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total	Max. Marks	TW	PPE	Min. Passing Marks
-	10	-	-	5	-	-	-	-	-	200	200	-	100

Contents :

Student is expected to choose the topic of his/her dissertation. The scope of proposed study must be in the relevant discipline/area. Student is expected to carry out the following –

1. Identification of proposed Topic/Area of Study for the Dissertation

2. Literature Review related to proposed topic

3. Formulation of Scope & Methodology for the proposed study.

4. Formulation of Hypothesis for the selected study.

5. Preliminary Dissertation.

Student should prepare & submit a Pre-Dissertation report minimum 50 pages in the given format, covering the above mentioned tasks. Evaluation will be on the basis of brief report on dissertation study undertaken on specified date at the end of semester through seminar &viva-voce.

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NameoftheProgram : IVSemesterM.Tech.(CAD/CAM)
CourseCode : PCDS41
CourseTitle : Final Dissertation

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CourseScheme					ExaminationScheme								
					Theory					Practical			
Lecture	Tutorial	Practical	Periodsper Week	Credits	Duration ofPaper, Hrs	MSE	IE	ESE	Total	Max. Marks	TW	PPE	Min. Passing Marks
-	24	-	-	18	-	-	-	-	-	500	250	250	250

Contents :

Student is expected to carry out further work on the topic of his dissertation selected in Third Semester. For completion of the selected Dissertation study, the given student is to undertake various activities like Design and fabrication, System Analysis, System Modeling, System Design and Testing. The student has to deliver a pre-submission seminar on the specified schedule before final submission of the study report in the specified format with minimum of 70 pages. The student is also expected to write and register at least two research papers on his/her study undertaken in refereed journals and conferences. Evaluation for this component will be on the basis of submitted Report, Seminar & Viva-Voce.