UJJAIN ENGINEERING COLLEGE, UJJAIN (M. P.)

Established as Govt. Engineering College, Ujjain in 1966
(Declared Autonomous by Govt. of M.P.)

Principal, faculty and all the Staff of this College heartily welcome you in this prestigious institute.

Website	:	www.uecu.ac.in
Principal	:	Prof. Jitendra Kumar Srivastava, M. Tech, Ph. D
Mob. Number	:	9479971701
Phone Number (O)	:	0734 – 2511912 Fax : - 0734-2511912
E-mail	:	principal.uecu@gmail.com

Vision and Mission of the Institute

Vision:-

To develop and nurture the available human resources for the socio-economic and technological development in the state and the country as a whole.

Mission : -

To develop the institute as a centre of excellence in technical education for the benefit of society, industries and students with a focus on:

- Professional competency.
- Enhancement of research activities.
- Adaptability to the trends and changes in the global community.
- Linkage with industries and research organizations at National and international level.

About Ujjain Engineering College, Ujjain (M.P.)

Ujjain Engineering College, Ujjain formerly known as Government Engineering College, Ujjain was established in 1966 by Government of Madhya Pradesh with a view to improve the technical education. Qualified engineering graduates may thus be produced who could bear the responsibility of providing impetus to growing industrialization of the country. Ujjain Engineering College, Ujjain offers four year Bachelor in Technology (B. Tech) programme in six disciplines i. e. Civil Engineering, Chemical Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Electrical Engineering and Mechanical Engineering.

Under Graduate Courses Offered

SN	Branch of Engineering	Intake
1	B. Tech Civil Engineering	30
2	B. Tech Chemical Engineering	60
3	B. Tech Computer Science and Engineering	60
4	B. Tech Electronics and Communication Engineering	60
5	B. Tech Electrical Engineering	60
6	B. Tech Mechanical Engineering	60

Ujjain Engineering College, Ujjain offers two years Master in Engineering (ME) in Industrial Engineering and Management, ME in Computer Aided Structural Design and Drafting, ME in Digital Communication, Master of Technology in Chemical Engineering with Specialization in Environmental Management. The Civil and Mechanical engineering department is accredited by National Board of Accreditation (NBA), New Delhi.

Post Graduate Courses Offered

SN	Branch and Specialization	Intake
1	M. E. Computer Aided Structural Design and Drafting	25
2	M. E. Industrial Engineering and Management	18
3	M. E. Digital Communication	18
4	M. Tech Chemical Engineering with Specialization in Environmental Management	25

Ujjain Engineering College is recognized research center of Rajiv Gandhi Prodyogiki Vishwavidyalaya (RGPV, Bhopal) and offers Doctoral Programme (Ph. D) in various research areas; the researchers from all over the country and abroad are welcome to join our research programme. The Institute was declared autonomous by the state Government in the year 1998. Under this arrangement, it is governed by a Governing Body, whose Chairman is minister of Technical Education and Skill Development Department of Government of Madhya Pradesh and Secretary is principal, Engineering College, Ujjain.

The institute has dedicated and top-notched faculty member with most Professors, Associated Professors having Post Graduate and Ph. D degree from institute of national repute like NIT, IIT, Central University of the country. The faculty members coupled with modern infrastructure to support the cause of imparting technical education to budding engineers.

To fulfill the vision and mission of this institute in every way, the training and placement cell has a very positive approach towards placements and facilitates the process of placements of students passing out from the institute besides collaborating with leading organization and institute in setting up internship and training programme for students. The number of students placed through the campus interviews is continuously rising. On invitation many reputed industries visit the institute to conduct interviews and offers job to students. The placement cell organizes carrier guidance programmes for the students starting from the first year. The placement cell also arranges training programmes like mock interviews, group discussion, workshop for improvement of communication skill etc.

This institute has produced quality graduate engineers in different branches of engineering who have been absorbed in almost all the major public sectors and private sectors industries of the country. The feedback confirms the excellent track record of high-class performance of the students in different organizations. Many of its alumni are rendering their services to countries like USA, UK, Canada, France, Australia etc. This is matter of pride for the institution that some alumni have qualified Union Public Service Commission (UPSC) examination. The All India Council of Technical Education (AICTE) New Delhi has recognized it since beginning as a recognized engineering college with full participation in all the activities of All India Council of Technical Education (AICTE). Situated at Indore Road, the institute has vast campus spreading over nearly 300 acres of land. It has a strong infrastructure to support the cause of imparting technical education to budding engineers. The Post Graduate courses undertaken by the institute would add further excellence in the development of technical education.

From 2017 – 2020 the institute has been given a grant of Rs 10 crores by the World Bank under Technical Education Quality Improvement Programme (TEQIP) which has further strengthened the institute’s position on a national level. The institute is an object of pride for technical education of Madhya Pradesh.

Head of the Departments

SN	Department	Name of Head of Department	Contact Number
1	Civil Engineering	Prof. Ajay Kumar Gupta, M. Tech., Ph. D	9039610859
2	Chemical Engineering	Prof. A. K. Dwivedi, M. Tech., Ph. D	9039519105
3	Computer Science and Engineering	Prof. A. K. Mewafarosh, M. Tech.	9893440736
4	Electronics and Comm. Engineering	Prof. Neha Sharma, M. Tech., Ph. D	9407525745
5	Electrical Engineering	Prof. D. K. Sakravdia, M. Tech., Ph. D	9424892365
6	Mechanical Engineering	Prof. Sunil Punjabi M. Tech., Ph. D, Post Doc from Tel Aviv University, Israel	9926434450
7	Physics	Prof. V. K. Hinge, M. Sc, M. Phil, Ph. D	9300724010
8	Chemistry	Prof. Anil Kumar Mishra, M. Sc, Ph. D	9424410710
9	Mathematics	Prof. H. K. Patel, M. Sc, Ph. D	9424879497
10	Workshop	Prof. A. R. Madan M. Tech., Ph. D	8989052451

Hostel Wardens

SN	Hostel Name	Wardens	Contact Number
1	Chief Warden	Prof. B. K. Singh, M. Tech., Ph. D	9425093203
2	Boys Hostel	Prof. R. B. Gaikwad, M.Tech.	9425915240
3	Girls Hostel (GH-1)	Prof. Savita Maru, M. Tech., Ph. D	9407198811
4	Girls Hostel (GH-2)	Prof. Neha Sharma, M. Tech., Ph. D	9407525745
5	Girls Hostel (GH-3)	Dr. Deepti Sharma, M. Sc, Ph. D	9424469153

Key Persons Information

Vice Principal	Prof. V. K. Sukhwani, M. Tech., Ph. D	9424878696
Dean Student Welfare	Prof. A. K. Dwivedi, M. Tech., Ph. D	9039519105
Dean Academic	Prof. V. K. Hinge, M. Sc, M. Phil, Ph. D	9300724010
Dean Administration	Prof. B. K. Singh, M. Tech., Ph. D	9425093203
Dean Planning	Prof. Raghvendra Singh, M. Tech., Ph. D	9424933510
Drawing and Disbursement Officer	Prof. Ashok Sharma, M. Tech., Ph. D	9407158725
Controller Exam	Prof. Sanjay Verma, M. Tech., Ph. D	9424850845
Chairman Anti Ragging Committee	Prof. Umesh Pendharkar, M. Tech., Ph. D	9425916597
Security Officer	(i) Prof. D. K. Sakravdia, M. Tech., Ph. D	9424892365
	(ii) Prof. Dilip Sharma, M. Tech., Ph. D	9425307428
Training and Placement Officer	Prof. A. C. Shukla, M. Tech., Ph. D	9425362560
Professor Incharge Internship	Prof. Hemant Parmar, M. Tech., Ph. D	9425988231
Start-up and Innovation Cell	(i) Prof. A. C. Shukla, M. Tech., Ph. D	9425362560
	(ii) Prof. V. K. Hinge, M. Sc, M. Phil, Ph. D	9300724010
Sports Officer	Prof. R. B. Gaikwad, M. E.	9425915259
Librarian	Smt. Savita Prakash, M. Sc, M. Lib. and ISC, Diploma in Russian Language	9893780437
Assistant Librarian	Shri Yogesh Wavge, M. Lib., and ISC,	9977721938

	MSW, PGDCA	
Doctor, Institute Dispensary	Dr. Ramesh Makwana, MBBS	9424014759
Professor Incharge B. Tech First Year	(i) Prof. Rakesh Kumar Rai, M. Sc, Ph. D	9425986042
	(ii) Prof. Deepti Sharma, M. Sc, Ph. D	9424469153
Professor Incharge Student Section	(i)Prof. Raghvendra Singh, M. Tech., Ph. D	9424933510
	(ii)Prof. Rakesh Kumar Rai, M. Sc, Ph. D	9425986042
Professor Incharge Admission and Counselling	(i)Prof. Y. S. Thakur, M. Tech., Ph. D	9826573394
	(ii) Prof. S. R. Mansore	9977272385
Professor Incharge Scholarship	(i) Prof. A. R. Nigwal, M. Sc, Ph. D	8839231136
	(ii) Prof. K. S. Solanki, M. E.	9827907046
	(iii) Prof. Neha Nagar, M. Tech.	8871369332
Scholarship Incharge clerk	Shri R. C. Solanki	7649822979
Student Section Clerk	Shri Jashwant Singh	9977821269

Faculty Teaching in B. Tech First Year

SN	Name of Faculty	Subject Taught in B. Tech First Year	Contact Number
1	Prof. Rakesh Kumar Rai, M. Sc, Ph. D	Physics	9425986042
2	Prof. V. K. Hinge, M. Sc, M. Phil, Ph. D	Physics	9300724010
3	Prof. A. K. Mishra, M. Sc, Ph. D	Chemistry	9424410710
4	Prof. K. S. Chandel, M. Sc, Ph. D	Chemistry	7000198841
5	Prof. Manjusha Mimrot, M. Sc, Ph. D	Chemistry	9827580512
6	Prof. S. K. Jain, M. Sc, Ph. D	Mathematics	9425379097
7	Prof. H. K. Patel, M. Sc, Ph. D	Mathematics	9424879497
8	Prof. Deepti Sharma, M. Sc, Ph. D	Mathematics	9424469153
9	Prof. Leena Sharma, M. Sc, Ph. D	Mathematics	8839726121
10	Prof. A. R. Nigwal, M. Sc, Ph. D	Mathematics	8839231136
11	Prof. Jaya Chetnani, M. A. (English), M. Phil	English	7987789196
12	Prof. Prafulla Dubey, M. A.(English), M. Sc (Botany) MBA (HRM), LIII, D.El.Ed, LLB	English	9827317912
13	Prof. A. R. Madan, M.Tech., Ph. D	Workshop Practice	8989052451
14	Prof. Bindra Dabar, M. Tech.	Basic Electrical Engg.	9826668817
15	Prof. Neha Nagar, M. Tech.	Basic Electrical Engg.	8871369332
16	Manish, M. Tech.	Basic Electrical Engg.	9074310948
17	Prof. S. C. Solanki, M. Tech., Ph. D	Engg. Graphics	8139514709
18	Prof. Rupesh Raikwar, M. Tech.	Engg. Graphics	8770791387
19	Prof. Manish Jain, M. Tech.	Engg. Graphics	9406880766
20	Prof. Manish Mandeliya, M. Tech.	Basic Mech. Engg.	7987593012
21	Prof. Abutalib Chhipa, M. Tech.	Basic Mech. Engg.	9691523668
22	Prof. Sajid Qureshi, M. Tech.	Basic Mech. Engg	9826427740
23	Prof. Raghvendra Singh, M. Tech., Ph. D	Basic Civil Engg. & Engg. Mech.	9424933510
24	Prof Pawan Patidar, M. E.	Basic Civil Engg. & Engg. Mech.	9340003478
25	Prof. Shivnarayan Malviya, M. E.	Basic Civil Engg. & Engg. Mech.	9144160594

26	Prof. Radheshyam Sakravdia	Basic Civil Engg. & Engg. Mech.	8305732961
27	Prof. Naina Solanki, M. Tech.	Prog. for Problem Solving	8770490728
28	Prof. Vaisali G. , M. Tech.	Prog. for Problem Solving	8770033739
29	Prof.Rahul Paladiya, M. Tech.	Prog. for Problem Solving	9131761981
30	Prof. Rupa Rajoriya, M. Tech.	Prog. for Problem Solving	7440614372
31	Prof. Rahul Sharma, M. Tech.	Prog. for Problem Solving	8770232745
32	Prof. Payal Parmar, M. E.	Prog. for Problem Solving	9340648343
33	Prof. Rekha Singh, M. E.	Prog. for Problem Solving	9893015336
34	Prof. Ashish Jaduja, M. Tech.	Prog. for Problem Solving	9009516244

Ujjain Engineering College, Ujjain (MP) 456010

Scheme of Examination as per AICTE model curriculum 2018

Bachelor of Technology (B.Tech.)

W.E.F. JULY, 2018

Semester - I (FIRST) — SET A — CM/CS/ME Branches

S.N.	Category	Course Code	Course Title	Distribution of Marks				Contact hours per week			Credits
				ESE	MST	QAR/LQAR	Total	L	T	P	
1	BSC	MA 1301 /1302 [T]	Mathematics - I	70	20	10	100	3	1	0	**4**
2	BSC	PH 1301 [T]	Physics	70	20	10	100	3	1	0	**4**
3	ESC	ME 1302 [T]	Basic Mechanical Engg.	70	20	10	100	2	1	0	**3**
4	ESC	CE 1301 [T]	Basic Civil Engg. & Engg. Mechanics	70	20	10	100	2	1	0	**3**
5	ESC	CS 1301 [T]	Programming for Problem Solving	70	20	10	100	2	1	0	**3**
6	BSC	PH 1301 [P]	Physics	30	–	20	50	0	0	2	**1**
7	ESC	ME 1302 [P]	Basic Mechanical Engg.	30	–	20	50	0	0	2	**1**
8	ESC	CE 1301 [P]	Basic Civil Engg. & Engg. Mechanics	30	–	20	50	0	0	2	**1**
9	ESC	CS 1301 [P]	Programming for Problem Solving	30	–	20	50	0	0	4	**2**
			Total	**470**	**100**	**130**	**700**	**12**	**5**	**10**	**22**

Semester - I (FIRST) — SET B — CE/EC/EE Branches

S.N.	Category	Course Code	Course Title	Distribution of Marks				Contact hours per week			Credits
				ESE	MST	QAR/LQAR	Total	L	T	P	
1	BSC	MA 1301 [T]	Mathematics - I	70	20	10	100	3	1	0	**4**
2	BSC	CH 1301 [T]	Chemistry	70	20	10	100	3	1	0	**4**
3	ESC	EE 1301 [T]	Basic Electrical Engineering	70	20	10	100	2	1	0	**3**
4	ESC	ME 1301 [T]	Engineering Graphics	70	20	10	100	2	0	0	**2**
5	HSMC	EN 1301 [T]	English	70	20	10	100	4	0	0	**4**
6	BSC	CH 1301 [P]	Chemistry	30	–	20	50	0	0	2	**1**
7	ESC	EE 1301 [P]	Basic Electrical Engineering	30	–	20	50	0	0	2	**1**
8	ESC	ME 1301 [P]	Engineering Graphics	30	–	20	50	0	0	4	**2**
9	HSMC	EN 1302 [P]	Language Lab	30	–	20	50	0	0	2	**1**
10	ESC	ME 1303 [P]	Workshop	30	–	20	50	0	0	2	**1**
			Total	**500**	**100**	**150**	**750**	**14**	**3**	**12**	**23**

Note: Working Saturdays in a month together with 1 vacent class in a week can be used for other activities like cultural, sports, literary, NSS, etc.

BSC Basic Science Course

ESC Engineering Science Course

HSMC Humanities & Social Sciences including Management Courses

ESE End Semester Examination

MST Mid Semester test

QAR Quizzes Assignment & Regularity

LQAR Lab work Quizzes Assignment & Regularity

Ujjain Engineering College, Ujjain (MP) 456010

Scheme of Examination as per AICTE model curriculum 2018

Bachelor of Technology (B.Tech.)

W.E.F. JULY, 2018

Semester - II (SECOND) — SET A — CE/EC/EE Branches

S.N.	Category	Course Code	Course Title	Distribution of Marks				Contact hours per week			Credits
				ESE	MST	QAR/LQAR	Total	L	T	P	
1	BSC	MA 2301 [T]	Mathematics - II	70	20	10	100	3	1	0	**4**
2	BSC	PH 1301 [T]	Physics	70	20	10	100	3	1	0	**4**
3	ESC	ME 1302 [T]	Basic Mechanical Engineering	70	20	10	100	2	1	0	**3**
4	ESC	CE 1301 [T]	Basic Civil Engg. & Engg. Mechanics	70	20	10	100	2	1	0	**3**
5	ESC	CS 1301 [T]	Programming for Problem Solving	70	20	10	100	2	1	0	**3**
6	BSC	PH 1301 [P]	Physics	30	–	20	50	0	0	2	**1**
7	ESC	ME 1302 [P]	Basic Mechanical Engineering	30	–	20	50	0	0	2	**1**
8	ESC	CE 1301 [P]	Basic Civil Engg. & Engg. Mechanics	30	–	20	50	0	0	2	**1**
9	ESC	CS 1301 [P]	Programming for Problem Solving	30	–	20	50	0	0	4	**2**
			Total	**470**	**100**	**130**	**700**	**12**	**5**	**10**	**22**

Semester - II (SECOND) — SET B — CM/CS/ME Branches

S.N.	Category	Course Code	Course Title	Distribution of Marks				Contact hours per week			Credits
				ESE	MST	QAR/LQAR	Total	L	T	P	
1	BSC	MA 2301/ 2302 [T]	Mathematics - II	70	20	10	100	3	1	0	**4**
2	BSC	CH 1301 [T]	Chemistry	70	20	10	100	3	1	0	**4**
3	ESC	EE 1301 [T]	Basic Electrical Engineering	70	20	10	100	2	1	0	**3**
4	ESC	ME 1301 [T]	Engineering Graphics	70	20	10	100	2	0	0	**2**
5	HSMC	EN 1301 [T]	English	70	20	10	100	4	0	0	**4**
6	BSC	CH 1301 [P]	Chemistry	30	–	20	50	0	0	2	**1**
7	ESC	EE 1301 [P]	Basic Electrical Engineering	30	–	20	50	0	0	2	**1**
8	ESC	ME 1301 [P]	Engineering Graphics	30	–	20	50	0	0	4	**2**
9	HSMC	EN 1302 [P]	Language Lab	30	–	20	50	0	0	2	**1**
10	ESC	ME 1303 [P]	Workshop	30	–	20	50	0	0	2	**1**
			Total	**500**	**100**	**150**	**750**	**14**	**3**	**12**	**23**

Note: Working Saturdays in a month together with 1 vacent class in a week can be used for other activities like cultural, sports, literary, NSS, etc.

BSC Basic Science Course
ESC Engineering Science Course
HSMC Humanities & Social Sciences including Management Courses

ESE End Semester Examination
MST Mid Semester test
QAR Quizzes Assignment & Regularity
LQAR Lab work Quizzes Assignment & Regularity

Ujjain Engineering College, Ujjain							
B.TECH I SEMESTER							W.e.f. July, 2018
COURSE CONTENTS							
MA 1301	**Mathematics-I**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

Prerequisite: Higher secondary level mathematics.

Course Objective: The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

UNIT 1: Calculus: (6 lectures, 2 tutorials) [Weightage 10 marks]
Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.

UNIT 2: Calculus: (6 lectures, 2 tutorials) [Weightage 10 marks]
Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; indeterminate forms and L'Hospital's rule; Maxima and Minima.

UNIT 3: Sequences and series: (10 lectures, 3 tutorials) [Weightage 18 marks]
Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series for exponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series, Parseval's theorem.

UNIT 4: Multivariable Calculus (Differentiation): (8 lectures, 3 tutorials) [Weightage 14 marks]
Limit, continuity and partial derivatives, directional derivatives, total derivative; Tangent plane and normal line; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, Curl and Divergence.

UNIT 5: Matrices (10 lectures, 3 tutorials) [Weightage 18 marks]
Inverse and rank of a matrix, rank-nullity theorem; System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem, and Orthogonal transformation.

Suggested Text/Reference Books:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson Education
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. R. K. Jain, S. R. K. Iyenger, Advanced Engineering Mathematics, Narosa Publications.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

Course Outcomes (COs)

CO1	The students will be able to apply differential and integral calculus to notions of curvature and to improper integrals. Apart from various applications, they will have a basic understanding of Beta and Gamma functions.
CO2	The students will be able to apply differential calculus to find TSE of functions, to find limits of Indeterminate form and to find maxima and minima of functions.
CO3	The students will be able to understand the concepts of sequence and series, and determine limits of sequences and convergence and approximate sums of series, and will be able to Find the Fourier series representation of a function of one variable.
CO4	The students will be able to understand the theory of multivariable differentiation and will be able to apply it to find maxima and minima, Gradient, Curl and Divergence of functions.
CO5	The students will be able to understand the essential tools of matrices including eigen values, eigen vectors and diagonalization.

Ujjain Engineering College, Ujjain							
B.TECH. I/II SEMESTER						W.e.f. July, 2018	
COURSE CONTENTS							
CH 1301	**Chemistry**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	2	5	70	22

Course Objective:
The course introduces students to the role of chemistry in their field as an engineer. The students are expected to learn the chemistry which is useful to enhance their skill & knowledge. The students can apply knowledge gained in dealing with various projects or issues related with their work.

Unit I
WATER ANALYSIS & TREATMENT:
Sources, Impurities, Hardness & its units, Softening of water by Lime -Soda method, Boiler troubles (Scale and sludge, Caustic embrittlement, Boiler corrosion, Priming & foaming), Internal treatments of boiler feed water, Water analysis (determination of alkalinity, temporary and permanent hardness by complexometry). Numerical problems based on above water softening process & water analysis. (10 lecture)

Unit II
PERIODIC PROPERTIES:
Effective nuclear charge, penetration of orbitals, variation of s,p,d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarisability, oxidation states, coordination number and geometries, hard soft acids and bases, molecular geometries. (8 lecture)

Unit III
LUBRICANTS & LUBRICATION:
Introduction, Mechanisms of lubrication, Classification of lubricants. Significance and determination of Viscosity & viscosity index, Flash and fire points, Cloud and pour points, Aniline point, Acid Number, Saponification Number, Steam Emulsion Number. (6 lecture)

Unit IV
POLYMERS & POLYMERISATION:
Monomers, Polymers, their classification, Thermo & Thermosetting Plastics with examples, Bio-Polymerization, Biodegradable Polymers, Preparation, Properties & Applications of PVC, PVA, Teflon, Nylon 6, Nylon 6:6, Polyester, Phenol-Formaldehyde, Urea- Formaldehyde, Natural & Synthetic Rubbers, Vulcanization of Rubber.(8 lecture)

Unit V
PHASE EQUILIBRIUM & CORROSION :
Phase diagram of single component (Water & CO_2), Phase diagram of binary Eutectic System(Pb-Ag), Corrosion: Types, Mechanisms & prevention.(8 lecture)

Course Outcome:
Students after completion of the course must possess understanding & knowledge of Chemistry which is significant for them and will earn respective credits for it.

Evaluation:
Evaluation will be continuous an integral part of the class as well as through external assessments.

Contd….2..

REFERENCES:

1. Chemistry in Engineering & Technology, Vol-I & Vol –II, J.C. Kuriacose & J. Rajaram, TMG, New Delhi
2. A Text Book of Engineering Chemistry - S. S. Dara & A.K. Singh, S. Chand Publications, New Delhi
3. Engineering chemistry - Jain and Jain, Dhanpat Rai publications, New Delhi
4. Engineering chemistry – Shashi Chawla , Dhanpat Rai publications, New Delhi
5. Engineering Chemistry, Subha Ramesh & Others, Wiley India Pvt. Ltd., New Delhi
6. Chemistry of Engineering Materials, C.V. Agrawal, C.P. Murthy & A. Naidu, B S Publications, Hyderabad
7. Engineering Chemistry- B.K.Sharma, Krishna Prakashan Media (P) Ltd, Meerut.
8. Advance Inorganic Chemistry Vol.1, Gurdeep Raj ; Goel Publishing House, Meerut (U.P.)
9. Engineering Chemistry : A Text Book, Harish K. Chopra & Anupama Parmar; Narosa Publishing House Pvt. Darya Ganj, New Delhi.
10. Essentials of Physical Chemistry, Arun Bahl, B.S. Bahl & G.D. Tuli; S. Chand & Co. Pvt. Ltd., Ram Nagar New Delhi.

Chemistry Practical

NOTE: About 10 of the following core experiments must be performed during the session.

1. **Water Testing**
   - (i) Determination of Total hardness of water by EDTA titration method.
   - (ii) Determination of alkalinity of water sample by titration.
   - (iii) Chloride estimation in water by Argentometric titration.

2. **Fuels & lubricant testing:**
   - (i) Flash & fire point determination by
     - a) Pensky's Martin Apparatus,
     - b) Abel's Apparatus,
     - c) Cleveland's open cup Apparatus.
   - (ii) Viscosity and Viscosity index determination by
     - a) Redwood viscometer No.1
     - b) Redwood viscometer No.2
   - (iii) Determination of Moisture content in fuel

3. Identification of functional groups of organic compounds/ Determination of melting/ boiling point of organic compounds.

4. **Measurement of kinetics of simple reactions.**

5. **Redox titrations:**
   Determination of percentage purity of Ferrous salt or percentage of Fe in an iron alloy by redox titration using N-Phenyl Anthranilic acid as an indicator.

Ujjain Engineering College, Ujjain							
B.TECH I/II SEMESTER						W.e.f. July, 2018	
COURSE CONTENTS							
EE 1301	**Basic Electrical Engineering**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	2	1	2	4	70	22

UNIT-I :
D.C. Circuits: Circuit reduction by series, parallel, star delta transformation, circuit analysis by mesh and nodal method, voltage and current source representation, dependent and independent sources, source conversion, superposition theorem, Thevenin's theorem.

UNIT-II :
A.C. Circuits: Generation of alternating voltages, RMS & average value, form and peak factors, phasor representation polar, rectangular and exponential form, circuit parameters, R-L, R-C and RLC series, parallel and series parallel circuits. Instantaneous and average power, active and reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.

UNIT-III :
Magnetic Circuits: Flux MMF and their relation, analogy between magnetic and electric circuits, saturation, B-H curves, fringing and leakage flux, AC excitation in magnetic circuits, induced voltage, hysteresis effect and eddy currents.

UNIT-IV :
Transformer - Single-phase transformer, basic concepts and constructional features, types of transformer, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test. All day efficiency

UNIT-IV :
Rotating Electrical machines: Constructional features and working principle of DC machine, 3-Phase induction motor and synchronous machine.

References :

1. Vincent Del Toro - Electrical Engineering Fundamentals, PHI Learning
2.. Nagrath & Kothari - Basic Electrical Engineering, TMH.
3. Mittle & Mittal - Basic Electrical Engineering, III Edition TMH.
4. Cathey - Basic Electrical Engineering, Schaum Series, TMH.
5. Hughes - Electrical Technology, Pearson
6. Fitzarald & Batham – Basic Electrical Engineering.

List of Experiments :
1. Verification of KCL & KVL.
2. Study & measurement of power and power factor in R-L series circuit.
3. Study & measurement of power and power factor R-C series circuit.
4. Study & measurement of power and power factor R-L-C series circuit.
5. Study of Transformer.
6. Determination of equivalent circuit parameters by O.C. and S.C. test & estimation of voltage regulation & efficiency of transformer.
7. Measurement of various lines and phase quantities for a 3 phase circuit.

Ujjain Engineering College, Ujjain							
B.TECH I/II SEMESTER W.e.f. July, 2018							
COURSE CONTENTS							
ME 1301	**Engineering Graphics**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	2	0	4	4	70	22

Unit I

Scales : Representative friction, plain scales, diagonal scale, scale of chord.

Conic Sections : Construction of ellipse, parabola and hyperbola by different methods, normal and tangent

Special Curves : Cycloidal, Involutes, Archimedean and logarithmic spirals.

Unit II

Projection: Types of projection, orthographic projection, first angle and third angle projection, projection of points and lines, true inclinations and true length of straight lines, traces of straight lines, projection on auxiliary planes.

Unit III

Projection of plains and solids: Projection of circle, triangle and polygons, projection of polyhedrons, pyramids in different positions.

Unit IV

Section of Solids: Section of right solids by normal and inclined planes.

Development of Surfaces: Parallel line and radial line method for right solids.

Unit V

Isometric Projections: Isometric scale, isometric axes, Isometric projection from orthographic projections.

Conversion of pictorial view into orthographic view of simple wall brackets, bearing blocks and simple blocks.

Reference Books:

1. Engineering Drawing by N.D. Bhatt. & V.M. Panchal; Charotar Publishing House Pvt. Ltd.
2. Engineering Drawing & Graphics by Basant Agrawal & C.M. Agrawal; McGraw Hill.
3. Engineering Graphics by D.A. Hindoliya; B.S. Publication.
6. Engineering Drawing by P.S. Gill; S.K. Kataria & Sons.
7. Machine Drawing by N.D. Bhatt; Charotar Publishing House Pv.
8. Engineering Drawing & Graphics by K. Venugopal; New Age International.

Ujjain Engineering College, Ujjain

B.TECH. I/II SEMESTER **W.e.f. July, 2018**

COURSE CONTENTS

EN 1301	English	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	4	0	0	4	70	22

Unit I

Languages and skills of communication: linguistic techniques, Modern usages, Reading comprehension, English phonetic symbols/ signs, Oral presentation, Audition Communication, Processes of communication, Verbal and Non Verbal Communication, Barriers to Communication.

Unit II

Application of linguistic ability: Writing of definitions of Engineering terms, Objects, Processes and Principles (Listening) Topics of General Interest, Reproduction from business, daily life, travel, health, buying and selling, company structure, systems etc.

Unit III

Letter Writing: Applications, Enquiry, Calling quotations, Tenders, Order and complaint.

Unit IV

Precise Writing, Noting and drafting, Technical Descriptions of simple engineering objects and processes (Writing), Report writing, Précis writing, note writing, slogan writing comment, speech advertising.

Unit V

Writing technical reports of the type of observation report, Survey report, Report of trouble, Laboratory Report and Project Report on the subjects of engineering. (Speaking) Vocabulary, Presentations, Demonstrations, Conversation - Telephone media, socializing, cultural events, debates, speech.

Reference Books and software's: -

1. Business Correspondence and Report Writing - By Sharma, TMH.
2. Living English Structure - By W. S. Allen, Longmans.
3. English Grammar- Ehrlich, Schaum Series, TMH
4. Spoken English for India - By R.K. Bansal and IB Harrison (Orient Longman).
5. New International Business English - By Joans and Alexander (OUP).
6. Effective Technical Communication- Rizvi, TMH
7. Globerina software for language laboratory

Language Laboratory:

The objective of the language lab is to expose students to a variety of listening and speaking drills. This would especially benefit students who are deficient in English and it also aims at confidence building for interviews and competitive examinations. The Lab is to cover following syllabus.

1. Communication lab.
2. Listening skills.
3. Speaking skills.
   (A) Phonetic symbols, pronunciation.
   (B). conversation: telephonic, face to face, formal and informal situations
4. Oral presentation.

Ujjain Engineering College, Ujjain

B.TECH I SEMESTER **W.e.f. July, 2018**

COURSE CONTENTS

MA 1301	Mathematics-I	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	1	0	4	70	22

Prerequisite: Higher secondary level mathematics.

Course Objective: The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

UNIT 1: Calculus: (6 lectures, 2 tutorials) [Weightage 10 marks]
Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.

UNIT 2: Calculus: (6 lectures, 2 tutorials) [Weightage 10 marks]
Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; indeterminate forms and L'Hospital's rule; Maxima and Minima.

UNIT 3: Sequences and series: (10 lectures, 3 tutorials) [Weightage 18 marks]
Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series for exponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series, Parseval's theorem.

UNIT 4: Multivariable Calculus (Differentiation): (8 lectures, 3 tutorials) [Weightage 14 marks]
Limit, continuity and partial derivatives, directional derivatives, total derivative; Tangent plane and normal line; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, Curl and Divergence.

UNIT 5: Matrices (10 lectures, 3 tutorials) [Weightage 18 marks]
Inverse and rank of a matrix, rank-nullity theorem; System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem, and Orthogonal transformation.

Suggested Text/Reference Books:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson Education
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. R. K. Jain, S. R. K. Iyenger, Advanced Engineering Mathematics, Narosa Publications.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

Course Outcomes (COs)

CO1	The students will be able to apply differential and integral calculus to notions of curvature and to improper integrals. Apart from various applications, they will have a basic understanding of Beta and Gamma functions.
CO2	The students will be able to apply differential calculus to find TSE of functions, to find limits of Indeterminate form and to find maxima and minima of functions.
CO3	The students will be able to understand the concepts of sequence and series, and determine limits of sequences and convergence and approximate sums of series, and will be able to Find the Fourier series representation of a function of one variable.
CO4	The students will be able to understand the theory of multivariable differentiation and will be able to apply it to find maxima and minima, Gradient, Curl and Divergence of functions.
CO5	The students will be able to understand the essential tools of matrices including eigen values, eigen vectors and diagonalization.

Ujjain Engineering College, Ujjain

B.TECH. I/II SEMESTER **W.e.f. July, 2018**

COURSE CONTENTS

PH 1301	Physics	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	1	1	5	70	22

Course Outcomes (COs): On completion of the course, the students will be able to:

- Appreciate the concept which leads to the origin & evolution of quantum mechanics.
- Comprehend the Schrodinger equation and apply the same for solving the problems of one dimensional motion of particles.
- Identify and solve the problems of wave optics and verify the same using various optical instruments.
- Get acquainted with the basic concept of Crystal structure and nuclear physics
- Explain the working principle of LASER and Optical fiber and perform experiments using LASER source.

Unit I

Quantum Physics-I: Introduction and Origin of Quantum hypothesis, Compton effect, de Broglie's hypothesis of matter wave & its experimental verification. Group velocity, Phase velocity, Particle Velocity & their relationship. Heisenberg' Uncertainty principle with elementary proof, its application to Gamma ray microscope and single slit experiment.

Unit II

Quantum Physics-II: Wave function and its physical interpretation, Equation of motion of matter waves, operators, time independent and time dependent Schrödinger wave equation, Born interpretation, Application of Schrödinger equation to one dimensional problems (particle in a box and potential step and simple harmonic oscillator)

Unit III
Wave
Optics:

Interference: Fresnel's biprism, Interference in thin films, Newton's ring experiment and Michelson's interferometer.

Diffraction: Fraunhoffer diffraction at single slit, double slit and N-slit (Diffraction grating). Rayleigh criterion, resolving power of telescope and prism.

Polarization: Concept of polarized light, Brewster's law, Double refraction, Nicol prism, quarter & half wave plate. Production and detection of plane, circularly & elliptically polarized light.

Unit IV

Cristal Structure and Nuclear Physics:

Cristal Structure: Amorphous and Crystalline solids, Fundamental elements of symmetry, seven systems, cubic lattice, unit cell, Bravais space lattice, number of atoms per unit cell, coordination number, atomic radius, packing density, crystal planes, Miller indices, lattice parameter of cubic crystals, lattice interval between crystal planes, Reciprocal lattice.

Nuclear Physics: Particle accelerator (Linear Particle accelerator, Cyclotron, Synchrocyclotron Synchrotron and Betatron). Mass spectrograph (Bainbridge and Aston).

UNIT V

Laser and Fiber Optics:

Laser : Stimulated and spontaneous emission, Einstein's theory of matter radiation interaction and A & B Coefficients, active medium, Amplification of light by Population inversion, Pumping Schemes, Optical resonator cavity. Different types of Laser: gas laser (He-Ne and CO_2), solid state laser (Ruby and Nd-YAG). Applications of Laser in Science, Engineering & Medicine.

Fundamental idea about optical fiber, types of fibers, propagation of light through step index fiber (Ray theory), acceptance angle & cone, numerical aperture, V-number, pulse dispersion, attenuation, losses & various uses, applications of Optical Fiber.

Contd….2…

Reference Books:

1. A Text Book of Engineering Physics by Navneet Gupta and S. K. Tiwary- Dhanpat Rai & Co
2. Engineering physics by M.N. Avadhanulu and P.G. Kshirsagar. S. Chand & Co.
3. Introduction to atomic and nuclear physics- Harvey E. White- East-West Press, New Delhi.
4. Optics and atomic physics – Satyaprakash, Ratan Prakashan mandir Meeruth
5. Quantum Mechanics by Satyaprakash and C . K. Singh- Kedar Nath and Ram Nath and Co.
6. Concepts of Modern Physics by Arthur Beiser - Tata Mcgraw Hill (TMH)
7. Engineering Physics by A. S. Vasudeva - Tata Mcgraw Hill (TMH)
8. Solid State Physics by Adrianus J. Dekker – Macmillan India Ltd.
9. An Introduction to LASERS Theory and Applications by M. N. Avadhaunulu – S. Chand and Co.
10. Optics by Ajay Ghatak- Tata Mcgraw Hill (TMH)
11. Elements of nuclear Physics by R.P.S. Yadav and M.L. Pandya
12. Solid State Physics by R. L. Singhal

Experiments:

(1) To determine the wavelength of prominent lines (Violet and Green) of Mercury light with the help of plane diffraction grating and Spectrometer.

(2) To determine the surface tension of a liquid (water) by Jaegers method.

(3) To compare the illuminating power of two given sources (Electric filament bulb) with the help of Lummer – Brodhum Photometer and study of variation of illuminating power of given source with applied voltage.

(4) To determine radius of curvature of Plano – Convex lens by measuring the diameter of Newton's ring.

(5) To determine the frequency of an alternating current mains with the help of Sonometer using non - magnetic wire.

(6) To determine the refractive index (μ) and dispersive power (ω) of the material of the Prism for violet and red color of mercury light with the help of Spectrometer.

(7) To determine the focal length of a combination of two convergent lenses separated by a distance "X", with the help of Nodal slide assembly and verify the relation.

$$\frac{1}{F} = \frac{1}{F_1} + \frac{1}{F_2} - \frac{x}{F_1 F_2}$$

Where F_1, F_2 = Focal lengths of given lenses.
F = Focal length of the combination
X = Separation between the two lenses

(8) To determine the refractive index of a given liquid (Water) with the help of the plane Mirror, Convex lens and Spherometer.

(9) To determine Brewster's angle for a glass surface and hence determine refractive index of glass using Gallium Arsenide Diode Laser.

(10) To determine the resolving power of Telescope.

(11) To study the OR, AND, & NAND gate and verify the truth table.

(12) To study and verify Algebraic theorem.

(13) To study the effect of temperature on the reverse saturation current in junction diode and hence to determine the forbidden energy gap.

(14) Experiments related to laser, optical fibre and solid state Physics

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1										
CO2	3	3										1
CO3	3	3		2				3	3			
CO4	3	2										2
CO5	3	1						3	3			2

Ujjain Engineering College, Ujjain

B.TECH I/II SEMESTER **W.e.f. July, 2018**

COURSE CONTENTS

ME 1302	Basic Mechanical Engineering	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	2	1	2	4	70	22

Unit I

Thermodynamics : Basic concepts, properties, equilibrium state, zeroth, first and second law of thermodynamics, energy, enthalpy and entropy, ideal gas laws, analysis of thermodynamic processes, two phase system, formation of steam, properties of steam, use of steam table.

Unit II

Steam Boilers: Introduction, classification, functions of boiler mountings and accessories, working of Cochran boiler, Lancashire boiler, Locomotive boiler and Babcock-Wilcox boiler, boiler performance, efficiency, equivalent evaporation, types of draught, calculation for chimney height.

Unit III

I.C. Engines: Classification of I.C. engines, Otto cycle, Diesel cycle, working of two stroke petrol engine, two stroke diesel engine, working of four stroke petrol engine and four stroke diesel engine.

Unit-IV

Engineering Materials: Classification of engineering materials, Mechanical properties of materials, compositions, characteristics application of cost iron, mild steel, stainless steel, stress, strain, Hooke's law, stress-strain diagram for ductile and brittle material.

Unit - V

Foundry and Welding: Introduction, pattern, pattern materials, types of pattern, pattern allowances, Mould materials, types and properties of moulding sand.

Welding : Introduction, types of welding, gas welding, gas welding equipments, types of flames, A.C. and D.C. arc welding, metal inert gas, arc welding, carbon arc welding.

Books Recommended:

1. Basic Mechanical Engineering by Nag, Tripathi and Panwar, McGraw Hill
2. Basic Mechanical Engineering by R.K. Rajput, Laxmi Publication
3. Workshop Practice by Hazra and Choudhary (Vol-I); Media Pramoters
4. Workshop Technology by Chapman (Vol-I);CBS Publishers

Ujjain Engineering College, Ujjain							
B.TECH I/II SEMESTER w.e.f. July, 2018							
COURSE CONTENTS							
CE1301	**Basic Civil Engineering & Engineering Mechanics**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	2	1	2	4	70	22

Basic Civil Engineering

Course Objective :
To illustrate the fundamental concepts of civil engineering and engineering mechanics to students.

Unit I
Building Materials & Construction : Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing. Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability

Unit – II
Surveying & Positioning: Introduction to surveying Instruments – levels, thedolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurement of directions by different methods, measurement of elevations by different methods. Reciprocal leveling.

Unit –III Mapping & Sensing: Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.

Engineering Mechanics

Unit - IV
Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and nonconcurrent Co-planner forces, free Diagram, Force Diagram and Bow's notations, Application of Equilibrium Concepts: Analysis of plane Trusses: Method of joints, Method of Sections. Frictional force in equilibrium problems.

Unit – V
Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes. Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple.

Course Outcomes :

After the course student should be able to :

CO 1 Understand and familiarize with the basic building materials and construction elements and its properties.
CO 2 Demonstrate the basic equipments used in surveying.
CO 3 Apply the basic principles of surveying for computation of area and volume.
CO 4 Illustrate the system of forces and plot free body diagram for analyzing different members.
CO 5 Compute center of gravity and moment of inertia for various structural members under different loading conditions.

Contd….2…..

Reference Books:

1. S. Ramamrutam & R.Narayanan; Basic Civil Engineering, Dhanpat Rai Pub.
2. Prasad I.B., Applied Mechanics, Khanna Publication.
3. Punmia, B.C., Surveying, Standard book depot.
4. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
5. S.P,Timoshenko, Mechanics of stricture, East West press Pvt.Ltd.
6. Surveying by Duggal – Tata McGraw Hill New Delhi.
7. Building Construction by S.C. Rangwala- Charotar publications House, Anand.
8. Building Construction by Grucharan Singh- Standard Book House, New Delhi
9. Global Positioning System Principles and application- Gopi, TMH
10. R.C. Hibbler – Engineering Mechanics: Statics & Dynamics.
11. A. Boresi & Schmidt- Engineering Mechines- statics dynamics, Thomson' Books
12. R.K. Rajput, Engineering Mechanics S.Chand & Co.

List of suggestive core Experiments:

Students are expected to perform minimum ten experiments from the list suggested below by preferably selecting experiments from each unit of syllabus.

1. To perform traverse surveying with prismatic compass, check for local attraction and determine corrected bearings and to balance the traverse by Bowditch's rule.
2. To perform leveling exercise by height of instrument of Rise and fall method.
3. To measure horizontal and vertical angles in the field by using Theodolite.
4. To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.
5. To determine the workability of fresh concrete of given proportions by slump test or compaction factor test.
6. To determine the Compressive Strength of brick.
7. To determine particle size distribution and fineness modulus of course and fine Aggregate.
8. To verify the law of Triangle of forces and Lami's theorem.
9. To verify the law of parallelogram of forces.
10. To verify law of polygon of forces
11. To find the support reactions of a given truss and verify analytically.
12. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
13. To determine the moment of inertia of fly wheel by falling weight method.
14. To verify bending moment at a given section of a simply supported beam.

Ujjain Engineering College, Ujjain							
B.TECH I/II SEMESTER						W.e.f. July, 2018	
COURSE CONTENTS							
CS 1301	**Programming for Problem Solving**	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	2	1	4	5	70	22

Unit 1

Introduction to Programming :

Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)

Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples.

From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code.

Unit 2

Arithmetic expressions and precedence

Conditional Branching and Loops

Writing and evaluation of conditionals and consequent branching

Unit 3

Arrays : Arrays (1-D, 2-D), Character arrays and Strings

Basic Algorithms: Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required)

Unit 4

Iteration and loops

Function: Functions (including using built in libraries), Parameter passing in functions, call by value, Passing arrays to functions: idea of call by reference

Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc. Quick sort or Merge sort.

Unit 5

Structure: Structures, Defining structures and Array of Structures

Pointers: Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation)

File handling.

Course Outcomes :

The student will learn :

1. To formulate simple algorithms for arithmetic and logical problems.
2. To translate the algorithms to programs (in C language).
3. To test and execute the programs and correct syntax and logical errors.
4. To implement conditional branching, iteration and recursion.
5. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
6. To use arrays, pointers and structures to formulate algorithms and programs.
7. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
8. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

Contd….2…

Suggested Text Books :

(i) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
(ii) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

Suggested Reference Books :

(i) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

(ii) Laboratory - Programming for Problem Solving[L : 0; T:0 ; P : 4 (2credits)]

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

Tutorial 1: Problem solving using computers:
Lab1: Familiarization with programming environment
Tutorial 2: Variable types and type conversions:
Lab 2: Simple computational problems using arithmetic expressions
Tutorial 3: Branching and logical expressions:
Lab 3: Problems involving if-then-else structures
Tutorial 4: Loops, while and for loops:
Lab 4: Iterative problems e.g., sum of series
Tutorial 5: 1D Arrays: searching, sorting:
Lab 5: 1D Array manipulation
Tutorial 6: 2D arrays and Strings
Lab 6: Matrix problems, String operations
Tutorial 7: Functions, call by value:
Lab 7: Simple functions
Tutorial 8 & 9: Numerical methods (Root finding, numerical differentiation, numerical integration):
Lab 8 and 9: Programming for solving Numerical methods problems
Tutorial 10: Recursion, structure of recursive calls
Lab 10: Recursive functions
Tutorial 11: Pointers, structures and dynamic memory allocation
Lab 11: Pointers and structures
Tutorial 12: File handling:
Lab 12: File operations

Laboratory Outcomes :

1. To formulate the algorithms for simple problems.
2. To translate given algorithms to a working and correct program.
3. To be able to correct syntax errors as reported by the compilers.
4. To be able to identify and correct logical errors encountered at run time.
5. To be able to write iterative as well as recursive programs.
6. To be able to represent data in arrays, strings and structures and manipulate them through a program.
7. To be able to declare pointers of different types and use them in defining self-referential structures.
8. To be able to create, read and write to and from simple text files.

UJJAIN ENGINEERING COLLEGE, UJJAIN (M.P.)

(Formerly Govt. Engg. College, declared Autonomous by Govt. of M.P.)

ACADEMIC CALENDAR

कार्यालय प्राचार्य उज्जैन इजी. कॉलेज उज्जैन
जावक क्रं./ 1909/ उज्जैन दि. 9.1.9/2022-23

SESSION : 2022-2023

S.No.	Particular		Semester		
			B.Tech. / ME / M.Tech. *1st Sem*		*B.Tech. / ME / M.Tech.* *2nd Sem*
01	*Duration of Semester*		*July-December 2022*		*January-June 2023*
02	*Commencement of Semester*		*26 September 2022 (for UG)*	*03rd Oct 2022 (for PG)*	*06th March 2023*
03	**Induction program for B.Tech 1st year**		*26 September - 07 October 2022*		-------
04	*Mid -Semester Test*	*First*	*07- 09th December 2022*		*26-27th April 2023*
		Second	*18-20th January 2023*		*24-26th May 2023*
05	*End of Teaching*		*25th January 2023*		*09th June 2023*
06	*Commencement of Examination (Theory & Practical)*		*02nd February 2023*		*16th June 2023*
07	**Vacations**	*Diwali*	*25th to 28th October 2022 (04 Days)*		
		Winter	---		
		Summer	*25thMay 2023 to 29th June 2023 (36 Days)*		
08	*Departmental Activities*		*To be conducted on weekends by the respective department*		
09	*Annual function*		*27th February 2023 to 4th March 2023*		
10	**Tentative date of commencement of academic session 2023-2024**		*10th July 2023*		

(Dr. Vijay Kumar Hinge)
Dean Academic
Ujjain Engineering College,
Ujjain (M.P.)

(Dr. J.K. Srivastava)
Principal
Ujjain Engineering College,
Ujjain (M.P.)

UJJAIN ENGINEERING COLLEGE, UJJAIN (MP) 456010

SESSION JULY- DEC-22 | TIME TABLE (B.Tech I SEM) | w.e.f. 26.09.2022

DAY	Branch	10:30 - 11:30	11:30 - 12: 30	12:30 to 01:15	01:15 - 02:15	02:15 - 03:15	03:15 - 04:15	04:15 - 05:15
		I	II		III	IV	V	VI
MONDAY	CE	CHEM LAB		RECESS	MATHS NG-1	CHEM NG-1	ENG. NG-1	BEE NG-1
	EC	ENG. NG-1	CHEM NG-1		BEE LAB (B-1) W/S (B-2)		MATHS NG-2	EG NG-2
	EE	MATHS NG-2	BEE NG-2		CHEM NG-2	ENG. NG-2	CHEM LAB (B-1) LANGUAGE LAB. (B-2)	
	CM	BME (B-1) BCE & EM LAB (B-2)			BME NG-3	MATHS NG-3	PHY NG-3	BCE & EM NG-3
	CS	PHY NG-3	BME NG-3		BME (B-1) BCE & EM LAB (B-2)		MATHS NF-1	PPS NF-1
	ME	BME NF-1	MATHS NF-1		PPS NF-1	PPS LAB (B-1) PPS LAB (B-2)		
	HM	CHEM	MATHS		EG LAB			
TUESDAY	CE	LANGUAGE LAB.			ENG. NG-1	CHEM NG-1	MATHS NG-1	BEE NG-1
	EC	CHEM NG-1	BEE NG-1		W/S LAB (B-1) BEE LAB (B-2))		MATHS NG-2	ENG. NG-2
	EE	MATHS NG-2	CHEM NG-2		EG LAB			
	CM	PHY LAB ; (B-1) PPS LAB (B-2)			BME NG-2	PHY NG-2	PPS NF-1	BCE & EM NF-1
	CS	BCE & EM NG-3	BME NG-3		PHY LAB ; (B-1) PPS LAB (B-2)		PHY NG-3	PPS NG-3
	ME	MATHS NF-1	PHY NF-1		PPS NG-3	BCE & EM NG-3	BME LAB(B-1) BCE & EM LAB(B-2)	
	HM	CHEM	MATHS		BEE	ENG.	CHEM LAB (B-1) LANGUAGE LAB. (B-2)	
WEDNESDAY	CE	BEE LAB			EG LAB			
	EC	EG NG-1	ENG. NG-1		CHEM LAB (B-1) LANGUAGE LAB. (B-2)		MATHS NG-1	BEE NG-1
	EE	MATHS NG-2	CHEM NG-2		BEE NG-2	ENG. NG-2	BEE LAB (B-1) W/S LAB (B-2)	
	CM	PPS LAB (B-1)	PPS LAB (B-2)		MATHS NG-3	BME NG-3	PHY NG-3	PPS NG-3
	CS	PHY NG-3	MATHS NG-3		PPSLAB (B-1)	PPS LAB (B-2)	BME NG-2	BCE & EM NG-2
	ME	BME NF-1	PHY NF-1		BCE &EM NF-1	MATHS NF-1	PHY LAB (B-1) PPSLAB (B-2)	
	HM	MATHS	EG		BEE LAB (B-1) W/S (B-2)		CHEM	ENG.
THURSDAY	CE	W/S LAB			CHEM NG-1	MATHS NG-1	ENG. NG-1	EG NG-1
	EC	MATHS NG-1	CHEM NG-1		EG LAB			
	EE	CHEM NG-2	BEE NG-2		EG NG-2	ENG. NG-2	LANGUAGE LAB. (B-1) CHEM LAB (B-2)	
	CM	PPS LAB (B-1) PHY LAB (B-2)			PPS NG-3	PHY NG-3	MATHS NG-3	
	CS	PHY NG-3	PPS NG-3		PPS LAB (B-1) PHY LAB (B-2)		MATHS NG-2	
	ME	PHY NF-1	MATHS NF-1		BME NF-1	BCE&EM NF-1	BCE & EM LAB (B-1) BME LAB (B-2)	
	HM	BEE	ENG.		MATHS	CHEM	BEE LAB (B-2) W/S LAB (B-1)	
FRIDAY	CE	MATHS NG-1	CHEM NG-1		EG. NG-1	BEE NG-1	ENG. NG-1	
	EC	CHEM NG-2	ENG. NG-2		LANGUAGE LAB.LAB (B-1) CHEM LAB (B-2)		BEE NG-3	
	EE	W/S LAB (B-1) (ARM) BEE LAB (B-2))			EG NG-2	ENG. NG-2	MATHS NG-2	
	CM	BCE & EM LAB (B-1) BME LAB (B-2)			MATHS NG-3	BCE & EM NG-3		
	CS	BCE & EM NG-3	MATHS NG-3		BCE & EM LAB (B-1) BME LAB (B-2)			
	ME	PPS NF-1	PHY NF-1		PPS LAB (B-1) PHY LAB (B-2)			
	HM	PHY	ENG.		EG	BEE	CHEM LAB (B-2) LANGUAGE LAB. (B-1)	

Professor-in-charge
Time Table

BCE & EM Lab: Alternate week (BCE - I, III, V week and EM II, IV week)

NOTE: ROOM NO. NF-2 FOR HINDI MEDIUM (HM)

Principal
Ujjain Engineering College