Walchand College of Engineering

(Government Aided Autonomous Institute)

Vishrambag, Sangli-416415

1947

Syllabus

S. Y. M. Tech.

(Computer Science and Information Technology)

With effect from

Academic Year
2023-24 (SY M.Tech)

P.G-Co-ordinator
IT Dept.

DAC
IT Dept.

HOD
IT Dept.

Walchand College of Engineering, Sangli

(Government Aided Autonomous Institute)

AY 2023-24

Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem III
Course Code	6IT671
Course Name	Dissertation Phase I
Desired Requisites:	Concept knowledge of research methodology, project management, Computer science and Information technology

Teaching Scheme		**Examination Scheme (Marks)**			
Practical	6 Hrs/ Week	**LA1**	**LA2**	**Lab ESE**	**Total**
Interaction	-	100	0	0	100
		Credits: 03			

Course Objectives

1	To develop the student to apply the knowledge gained to identify problems for research and provide the solutions by self-study and interaction with stakeholders.
2	Acquire knowledge to tackle real world problems of societal concerns
3	Impart flexibility to the student to have increased control over his/ her learning
4	Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor
5	Enhance a students' learning through increased interaction with peers and colleagues.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Search the existing literature and identification of research problem	IV	Analyzing
CO2	Design and develop the solution for complex engineering problem	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

Course Content

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set-up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects this semester. The students are required to submit the dissertation work in the form of report as per the institute rule

Textbooks

1	As per the research topic

References

1	National and International Journals

Useful Links

1	https://nptel.ac.in/courses/121/106/121106007/
2	https://www.youtube.com/watch?v=mAVswCbz_jM&feature=emb_imp_woyt
3	https://nptel.ac.in/courses/110/104/110104073/
4	https://nptel.ac.in/courses/110/107/110107081/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	1			1		2
CO2	1		1		2	1
CO3		2				1
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment				
There are three components of lab assessment, LA1, LA2 and Lab ESE.				
Assessment	**Based on**	**Conducted by**	**Typical Schedule**	**Marks**
LA1	Lab activities, attendance, journal	Lab Course Faculty	During semester Marks Submission at the end of semester	100
Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.				

Assessment Plan based on Bloom's Taxonomy level				
Bloom's Taxonomy Level	**LA1**	**LA2**	**Lab ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	20			20
Apply	25			25
Analyze	15			15
Evaluate	25			25
Create	15			15
Total	**100**			**100**

Walchand College of Engineering, Sangli

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AY 2023-24

Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem III
Course Code	6IT672
Course Name	Dissertation Phase II
Desired Requisites:	Concept knowledge of research methodology, project management, Computer science and Information technology

Teaching Scheme		**Examination Scheme (Marks)**			
Practical	6 Hrs/ Week	**LA1**	**LA2**	**Lab ESE**	**Total**
Interaction	-	0	100	0	100
		Credits: 03			

Course Objectives

1	To develop the student to apply the knowledge gained to identify problems for research and provide the solutions by self-study and interaction with stakeholders.
2	Acquire knowledge to tackle real world problems of societal concerns
3	Impart flexibility to the student to have increased control over his/ her learning
4	Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor
5	Enhance a students' learning through increased interaction with peers and colleagues.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Search the existing literature and identification of research problem	IV	Analyzing
CO2	Design and develop the solution for complex engineering problem	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

Course Content

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set-up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects this semester. The students are required to submit the dissertation work in the form of report as per the institute rule

Textbooks

1	As per the research topic

References

1	National and International Journals

Useful Links

1	https://nptel.ac.in/courses/121/106/121106007/
2	https://www.youtube.com/watch?v=mAVswCbz_jM&feature=emb_imp_woyt
3	https://nptel.ac.in/courses/110/104/110104073/
4	https://nptel.ac.in/courses/110/107/110107081/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	1			1		2
CO2	1		1		2	1
CO3		2				1
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment				
There are three components of lab assessment, LA1, LA2 and Lab ESE.				
Assessment	**Based on**	**Conducted by**	**Typical Schedule**	**Marks**
LA2	Lab activities, attendance, journal	Lab Course Faculty	During semester Marks Submission at the end of semester	100
Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.				

Assessment Plan based on Bloom's Taxonomy level				
Bloom's Taxonomy Level	**LA1**	**LA2**	**Lab ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand		20		20
Apply		25		25
Analyze		15		15
Evaluate		25		25
Create		15		15
Total		**100**		**100**

Walchand College of Engineering, Sangli

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AY 2023-24

Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem III
Course Code	6IT673
Course Name	Dissertation Phase III
Desired Requisites:	Concept knowledge of research methodology, project management, Computer science and Information technology

Teaching Scheme		**Examination Scheme (Marks)**			
Practical	8 Hrs/ Week	**LA1**	**LA2**	**Lab ESE**	**Total**
Interaction	-	00	00	100	100
		Credits: 04			

Course Objectives

1	To develop the student to apply the knowledge gained to identify problems for research and provide the solutions by self-study and interaction with stakeholders.
2	Acquire knowledge to tackle real world problems of societal concerns
3	Impart flexibility to the student to have increased control over his/ her learning
4	Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor
5	Enhance a students' learning through increased interaction with peers and colleagues.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Search the existing literature and identification of research problem	IV	Analyzing
CO2	Design and develop the solution for complex engineering problem	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

Course Content

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set-up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects this semester. The students are required to submit the dissertation work in the form of report as per the institute rule

Textbooks

1	As per the research topic

References

1	National and International Journals

Useful Links

1	https://nptel.ac.in/courses/121/106/121106007/
2	https://www.youtube.com/watch?v=mAVswCbz_jM&feature=emb_imp_woyt
3	https://nptel.ac.in/courses/110/104/110104073/
4	https://nptel.ac.in/courses/110/107/110107081/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	1			1		2
CO2	1		1		2	1
CO3		2				1
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment				
There are three components of lab assessment, LA1, LA2 and Lab ESE.				
Assessment	**Based on**	**Conducted by**	**Typical Schedule**	**Marks**
ESE	Lab activities, attendance, journal	Lab Course Faculty	During semester Marks Submission at the end of semester	100
Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.				

Assessment Plan based on Bloom's Taxonomy level				
Bloom's Taxonomy Level	**LA1**	**LA2**	**Lab ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand			20	20
Apply			25	25
Analyze			15	15
Evaluate			25	25
Create			15	15
Total			**100**	**100**

Walchand College of Engineering, Sangli *(Government Aided Autonomous Institute)*						
AY 2022-23						
Course Information						
Programme	M. Tech (CS and IT)					
Class, Semester	Second Year M. Tech., Sem III					
Course Code	6IT611					
Course Name	Professional Elective – 5: Parallel Algorithms					
Desired Requisites:	Computer Algorithm					
Teaching Scheme		**Examination Scheme (Marks)**				
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**	
Tutorial	-	30	20	50	100	
Practical	-					
Interaction	-	**Credits: 3**				

Course Objectives	
1	To experiment the parallel architecture in Parallel Algorithms
2	To use the process of parallelization in computer algorithms
3	To compare the thread and process parallel architecture

Course Outcomes (CO) with Bloom's Taxonomy Level		
At the end of the course, the students will be able to,		
CO1	Implement the sequential and parallel algorithms	Apply
CO2	Compare the speedup factor of sequential and parallel algorithms	Analyze
CO3	Design the parallel algorithm to improve the performance parameters	Create

Module	**Module Contents**	**Hours**
I	Parallel Computing: Motivation and scope	6
II	GPGPU Programming : OpenACC, CUDA, OpenCL	6
III	Trends in processor architecture and limitations of memory systems	6
IV	Dichotomy and organization of parallel platforms	7
V	Communication costs in parallel machines	7
VI	Routing mechanism and processor mapping techniques	7

Text Books	
1	Anath Grama, Ansul Gupta, George Karypis, Vipin Kumar, *"Introduction to parallel computing",* Second Edition, Pearson Education, 2003
2	Jaegeun Han, Bharatkumar Sharma, *"Learn CUDA Programming",* First Edition, Packt publishing, 2019

References	
1	Horrowitz, Sahni Rajasekaran, "Computer Algorithms", Computer Science, W. H. Freeman and company Press, New york

Useful Links	
1	https://nptel.ac.in/courses/106/102/106102114/
2	https://nptel.ac.in/courses/106/102/106102163/

CO-PO Mapping						
Programme Outcomes (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2			3		
CO2		2			1	
CO3			1	1		

Assessment
The assessment is based on MSE, ISE and ESE. MSE shall be typically on modules 1 to 3. ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Assessment Plan based on Bloom's Taxonomy Level				
Bloom's Taxonomy Level	**MSE**	**ISE**	**ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Apply	10	10	20	**40**
Analyze	10	5	10	**25**
Evaluate	10	5	10	**25**
Create			10	**10**
Total	**30**	**20**	**50**	**100**

Walchand College of Engineering, Sangli
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AY 2022-23

Course Information

Programme	M. Tech. (CS and IT)
Class, Semester	Second Year M. Tech., Sem IV
Course Code	6IT612
Course Name	Professional Elective – 5: Software Reliability and Testing
Desired Requisites:	Software Engineering

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
Practical	-				
Interaction	-	**Credits: 3**			

Course Objectives

1	To elaborate Software Reliability and Testing.
2	To illustrate project management cycle for software development.
3	To use Agile development techniques for software development.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO1	Apply concepts of Software Reliability and Testing	Understand
CO2	Analyze Software Reliability Growth Models in Software Development	Analyze
CO3	Evaluate the Software system to detect fault tolerance	Analyze

Module	**Module Contents**	**Hours**
I	**Basic of Software Testing:** Software Testing, Testing types, Flow graph, Cyclomatic complexity, Graph Matrices, Debugging & Test Case Strategies	7
II	**Software Quality:** Software Quality Assurance, Software Reuse, Documentation Requirements, Standards, Software Configuration Management, Version Control, Baselines	7
III	**Software Reliability:** Software Reliability, Software Reliability Issues, Statistical Testing and Software Quality Management, ISO 9000, Case Tools, Characteristics of Case Tools	7
IV	**User Interface and Design**: Concept of user Interface and Design, Types of user Interface, Component Based GUI Development	7
V	**Software Fault Detection:** Basic terminology of Fault tolerant, Fault detection using fault tree, Fault tolerant in SRE, Techniques for Fault tolerant: Recovery blocks, N- version programming	5
VI	**Software Fault Analysis:** Fault tree modelling, Fault tree analysis, Analysis of fault tolerant software system, Quantitative analysis of fault tolerant system	6

Text Books

1	Jalote Pankaj, *"An Integrated Approach to Software Engineering",* Narosa Publication, 3rd Edition, 2010.
2	Sommerville, *"Software Engineering"*, Pearson Education India, New Delhi,2nd Edition, 2006

References

1	Musa John D., *"Software Reliability Engineering"*, Tata McGraw Hill, 2nd Edition, 1999

2	Lyu, *"Software Reliability Engineering"*, IEEE Computer Society Press, 1st Edition, 1996
Useful Links	
1	Module I, II, III, IV, V - https://onlinecourses.nptel.ac.in/noc21_cs15/preview

CO-PO Mapping						
Programme Outcomes (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		2	1		
CO2	1					2
CO3		2		3		

Assessment

The assessment is based on MSE, ISE and ESE.
MSE shall be typically on modules 1 to 3.
ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.
ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.
For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing).

Assessment Plan based on Bloom's Taxonomy Level				
Bloom's Taxonomy Level	**MSE**	**ISE**	**ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Apply	10	10	20	**40**
Analyze	10	5	10	**25**
Evaluate	10	5	10	**25**
Create			10	**10**
Total	**30**	**20**	**50**	**100**

Walchand College of Engineering, Sangli
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Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem III
Course Code	6IT613
Course Name	Professional Elective - 5: Visual Computing
Desired Requisites:	

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
Practical	-				
Interaction	-	**Credits: 3**			

Course Objectives

1	To elaborate need of developing graphics application in visual computing
2	To demonstrate the graphics primitives like: line, circle, polygon etc.
3	To transform the media data for application development

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO1	Draw Geometric primitives using OpenGL	Analyze
CO2	Implement basic transformations on objects using OpenGL	Apply
CO3	Apply clipping algorithm on lines using OpenGL	Apply

Module	**Module Contents**	**Hours**
I	**Introduction to Image Processing &Modeling:** Level of image data representation, Traditional & hierarchical data structure Image Enhancement in spatial domain, 3-D Modeling, Basic 3-D Programming principles	4
II	**Animation Techniques:** Traditional Animation, Principles of Animation, Overview & low-level motion specification, Animating articulated structures, soft object animation, procedural animation	5
III	**The OpenGL:** OpenGL Architecture, OpenGL API, primitives and attributes, First program in OpenGL, Drawing lines and shapes in OpenGL	4
IV	**Geometric Objects & Transformations:** Scalars, points and Vectors, Three-dimensional primitives, coordinate systems, OpenGL transformation Translation, scaling, Rotation. Composition of Transformation	5
V	**Lighting and surfacing:** Light and matter, the phong lighting model; computation of vectors; polygon shading; Approximation of sphere by recursive subdivision; Light sources in OpenGL; Specification of material in OpenGL	4
VI	**Rendering:** Display Lists, Texture mapping, Photon mapping, Radiosity, Ray Tracing, global illumination, shading of surfaces	4

Text Books

1	Edward Angel, "*Interactive Computer Graphics: A Top-Down Approach with OpenGL"*, 4th Edition Addison-Wesley, 2005
2	Gonzalez & Woods, *"Digital Image Processing",* Thomson Press, 4th Edition, 2015

References

1	F. S. Hill Jr. and S. M. Kelley , *"Computer Graphics using OpenGL (3/e)",* Pearson, 2007
2	ShalliniGovil-Pai, *"Principles of computer Graphics"* , Springer, first edition, 2005
3	Rechard Wright & Sweet, *"OpenGLSuperBible",* QUE, 2nd Edition, 2000

Useful Links	
1	https://www.coursera.org/learn/computer-vision-basics#syllabus
2	https://www.classcentral.com/course/udacity-introduction-to-computer-vision-1022
3	https://www.classcentral.com/course/introduction-computer-vision-watson-open-13849

CO-PO Mapping						
	Programme Outcomes (PO)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		2			1
CO2		2		3		
CO3	1		1			

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Assessment Plan based on Bloom's Taxonomy Level				
Bloom's Taxonomy Level	**MSE**	**ISE**	**ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Apply	10	10	20	**40**
Analyze	10	5	10	**25**
Evaluate	10	5	10	**25**
Create			10	**10**
Total	**30**	**20**	**50**	**100**

Walchand College of Engineering, Sangli
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AY 2022-23

Course Information

Programme	MTech. (CS & IT)
Class, Semester	M. Tech., Sem III
Course Code	
Course Name	Professional Elective - 5: IoT Systems and Applications
Desired Requisites:	Computer Networks

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
	-	**Credits: 3**			

Course Objectives

1	To infer the concept of Internet of Things (IoT).
2	To apply basic WSN protocols for IoT systems.
3	To create IoT based applications in different paradigms.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Apply IoT concept in real time scenario	III	Applying
CO2	Analyze use of WSN protocols in IoT applications	III	Applying
CO3	Develop IoT enabled services	VI	Creating

Module	**Module Contents**	**Hours**
I	**Introduction to IoT:** Sensing, Actuation, Basics of Networking, Communication Protocols	7
II	**Sensor Networks:** Machine-to-Machine Communications, Interoperability in IoT	7
III	Introduction toIoT Programming: Integration of Sensors and Actuators with Arduino, Introduction to Python programming, Introduction to Raspberry Pi, Implementation of IoT with Raspberry Pi	7
IV	**Introduction to SDN:** SDN for IoT, Data Handling and Analytics, Cloud Computing, Sensor-Cloud, Fog Computing	6
V	**IOT Application:** Smart Cities and Smart Homes, Connected Vehicles, Smart Grid, Industrial IoT	6
VI	**Case Study:** Agriculture, Healthcare, Activity Monitoring	6

Text Books

1	Arshdeep Bahga and Vijay K. Madisetti, *"Internet of Things: A Hands-on Approach",* VPT, 1st Edition, 2014
2	Samuel Greengard, *"The internet of things",* MIT Press, 1st Edition, 2015

References

1	Pethuru Raj and Anupama C. Raman, *"The Internet of Things: Enabling Technologies, Platforms, and Use Cases"*, CRC Press, 1st edition, 2017
2	Adrian McEwen, Hakim Cassimally*," Designing the Internet Of Things"*, Wiley, 1st Edition, 2013

Useful Links	
1	https://onlinecourses.nptel.ac.in/noc19_cs65/preview

CO-PO Mapping						
Programme Outcomes (PO)						
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
CO1	1		2			
CO2			3			
CO3	2					

Assessment
The assessment is based on MSE, ISE and ESE. MSE shall be typically on modules 1 to 3. ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Assessment Plan based on Bloom's Taxonomy Level				
Bloom's Taxonomy Level	**MSE**	**ISE**	**ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Apply	10	10	20	**40**
Analyze	10	5	10	**25**
Evaluate	10	5	10	**25**
Create			10	**10**
Total	**30**	**20**	**50**	**100**

Walchand College of Engineering, Sangli

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Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem III
Course Code	6IC602
Course Name	Constitution of India
Desired Requisites:	

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	2 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 0			

Course Objectives

1	To review and create awareness on various provisions in the constitution of India.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Explain the premises informing the twin themes of liberty and freedom from a civil rights perspective.	II	Understanding
CO2	Address the growth of Indian opinion regarding modern Indian intellectuals constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism	II	Understanding
CO3	Address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution	II	Understanding

Module	**Module Contents**	**Hours**
I	History of Making of the Indian Constitution Drafting Committee, (Composition & Working)	4
II	**Philosophy of the Indian Constitution :** Preamble, Salient Feature	4
III	**Contours of Constitutional Rights:** Fundamental Rights; Right to Equality; Right to Freedom; Right against Exploitation; Right to Freedom of Religion; Cultural and Educational Rights; Right to Constitutional Remedies; Directive Principles of State Policy; Fundamental Duties.	5
IV	**Organs of Governance:** Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions	5

V	**Local Administration:** District"s Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Pachayati raj: Introduction, PRI: Zila Pachayat. Elected officials and their roles, CEO ZilaPachayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy	5
VI	**Election Commission:** Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.	5

Textbooks	
1	Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
2	M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014
3	D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015
References	
1	The Constitution of India, 1950 (Bare Act), Government Publication
Useful Links	
1	https://en.wikipedia.org/wiki/Constituent_Assembly_of_India
2	https://nptel.ac.in/courses/129/106/129106003/
3	https://nptel.ac.in/noc/courses/noc20/SEM2/noc20-lw02/
4	https://eci.gov.in/about/about-eci/the-functions-electoral-system-of-india-r2/

CO-PO Mapping

	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1			1			
CO2	2					
CO3				1		2

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High
Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE.
MSE shall be typically on modules 1 to 3.
ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.
ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.
For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Assessment Plan based on Bloom's Taxonomy Level				
Bloom's Taxonomy Level	**MSE**	**ISE**	**ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Apply	10	10	20	**40**
Analyze	10	5	10	**25**
Evaluate	10	5	10	**25**
Create			10	**10**
Total	**30**	**20**	**50**	**100**

Walchand College of Engineering, Sangli

(Government Aided Autonomous Institute)

AY 2023-24

Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem IV
Course Code	6IT691
Course Name	Dissertation Phase IV
Desired Requisites:	Concept knowledge of research methodology, project management, Computer science and Information technology

Teaching Scheme (Hrs)		**Examination Scheme (Marks)**			
Practical	10	**LA1**	**LA2**	**ESE**	**Total**
Interaction	-	100	0	0	100
		Credits: 5			

Course Objectives

1	To develop the student to apply the knowledge gained to identify problem for research provide the solutions by self-study and interaction with stake holders
2	Acquire knowledge to tackle real world problems of societal concerns
3	Impart flexibility to the student to have increased control over his/ her learning.
4	Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor
5	Enhance student's learning through increased interaction with peers and colleagues.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Search the existing literature and identification of research problem	IV	Analysing
CO2	Design and develop the solution for complex engineering problem	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

Course Contents

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set-up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects in this semester. The students are required to submit the dissertation work in the form of report as per the institute rule.

Text Books

1	As per the research topic

References

1	National and International Journals

Useful Links

1	https://nptel.ac.in/courses/110/104/110104073/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	1			1		2
CO2			1		2	
CO3		2				2
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment				
There are three components of lab assessment, LA1, LA2 and Lab ESE.				
Assessment	**Based on**	**Conducted by**	**Typical Schedule**	**Marks**
LA1	Lab activities, attendance, journal	Lab Course Faculty	During semester Marks Submission at the end of semester	100
Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.				

Assessment Plan based on Bloom's Taxonomy level				
Bloom's Taxonomy Level	**LA1**	**LA2**	**Lab ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	20			20
Apply	25			25
Analyze	15			15
Evaluate	25			25
Create	15			15
Total	**100**			**100**

Walchand College of Engineering, Sangli

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AY 2023-24

Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem IV
Course Code	6IT692
Course Name	Dissertation Phase V
Desired Requisites:	Concept knowledge of research methodology, project management, Computer science and Information technology

Teaching Scheme (Hrs)		**Examination Scheme (Marks)**			
Practical	10	**LA1**	**LA2**	**ESE**	**Total**
Interaction	-	0	100	0	100
		Credits: 5			

Course Objectives

1	To develop the student to apply the knowledge gained to identify problem for research provide the solutions by self-study and interaction with stake holders
2	Acquire knowledge to tackle real world problems of societal concerns
3	Impart flexibility to the student to have increased control over his/ her learning.
4	Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor
5	Enhance student's learning through increased interaction with peers and colleagues.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Search the existing literature and identification of research problem	IV	Analysing
CO2	Design and develop the solution for complex engineering problem	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

Course Contents

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set- up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects in this semester. The students are required to submit the dissertation work in the form of report as per the institute rule.

Text Books

1	As per the research topic

References

1	National and International Journals

Useful Links

1	https://nptel.ac.in/courses/110/104/110104073/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1				1		
CO2	1		1		2	2
CO3		2				2
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment				
There are three components of lab assessment, LA1, LA2 and Lab ESE.				
Assessment	**Based on**	**Conducted by**	**Typical Schedule**	**Marks**
LA2	Lab activities, attendance, journal	Lab Course Faculty	During semester Marks Submission at the end of semester	100
Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.				

Assessment Plan based on Bloom's Taxonomy level				
Bloom's Taxonomy Level	**LA1**	**LA2**	**Lab ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand		20		20
Apply		25		25
Analyze		15		15
Evaluate		25		25
Create		15		15
Total		**100**		**100**

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AY 2023-24

Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem IV
Course Code	6IT693
Course Name	Dissertation Phase VI
Desired Requisites:	Concept knowledge of research methodology, project management, Computer science and Information technology

Teaching Scheme (Hrs)		**Examination Scheme (Marks)**			
Practical	12	**LA1**	**LA2**	**ESE**	**Total**
Interaction	-	0	0	100	100
		Credits: 6			

Course Objectives

1	To develop the student to apply the knowledge gained to identify problem for research provide the solutions by self-study and interaction with stake holders
2	Acquire knowledge to tackle real world problems of societal concerns
3	Impart flexibility to the student to have increased control over his/ her learning.
4	Teachers would serve as mentor/facilitator of inquiry and reflection rather than as an instructor
5	Enhance student's learning through increased interaction with peers and colleagues.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Search the existing literature and identification of research problem	IV	Analyzing
CO2	Design and develop the solution for complex engineering problem	V	Evaluating
CO3	Create the new knowledge in the specialized field	VI	Creating

Course Contents

Students are expected to carry out independent research work on the chosen topic. In this semester it is expected that the student has carried out substantial research work including exhaustive literature survey, formulation of the research problem, development/fabrication of experimental set- up (if any/required) and testing, and analysis of initial results thus obtained. In fourth semester, the students continue their dissertation work. It is expected that the student has completed most of the experimental/computation works and analyzed the results so obtained as proposed in the synopsis. The work should be completed in all respects in this semester. The students are required to submit the dissertation work in the form of report as per the institute rule.

Text Books

1	As per the research topic

References

1	National and International Journals

Useful Links

1	https://nptel.ac.in/courses/110/104/110104073/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	1			1		2
CO2	1		1		2	2
CO3		2				2
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment				
There are three components of lab assessment, LA1, LA2 and Lab ESE.				
Assessment	**Based on**	**Conducted by**	**Typical Schedule**	**Marks**
ESE	Lab activities, attendance, journal	Lab Course Faculty	During semester Marks Submission at the end of semester	100
Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.				

Assessment Plan based on Bloom's Taxonomy level				
Bloom's Taxonomy Level	**LA1**	**LA2**	**Lab ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand			20	20
Apply			25	25
Analyze			15	15
Evaluate			25	25
Create			15	15
Total			**100**	**100**

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Course Information

Programme	M. Tech (CS and IT)
Class, Semester	Second Year M. Tech., Sem IV
Course Code	6IC601
Course Name	Value Education
Desired Requisites:	

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	2 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 0			

Course Objectives

1	To impart knowledge on value of education and self- development.
2	To imbibe good values in students.
3	To highlight importance of character.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, students will be able to,

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Explain value of education and self- development.	II	Understanding
CO2	Summarize importance of good character, and Behaviour development.	V	Evaluating

Module	**Module Contents**	**Hours**
I	Values and self-development –Social values and individual attitudes. Work ethics, Indian vision of humanism, Moral and non- moral valuation. Standards and principles, Value judgments.	6
II	Importance of cultivation of values, Sense of duty. Devotion, Self-reliance, confidence, Concentration. Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National Unity, Patriotism, Love for nature, Discipline.	6
III	Personality and Behaviour Development - Soul and Scientific attitude. Positive Thinking. Integrity and discipline, Punctuality, Love and Kindness, Avoid fault Thinking, Free from anger, Dignity of labour universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering, love for truth, Aware of self-destructive habits, Association and Cooperation, Doing best for saving nature	7
IV	Character and Competence –Holy books vs. Blind faith, Self-management and Good health, science of reincarnation, Equality, Nonviolence, Humility, Role of Women, All religions and same message, Mind your Mind, Self-control. Honesty, Studying effectively	7

Text Books

1	Chakroborty, S.K. "Values and Ethics for organizations Theory and practice", Oxford University Press, New Delhi

References

1	

Useful Links

1	https://nimsuniversity.org/wp-content/uploads/2018/02/Value-Education-Human-Rights-and-Legislative-Procedures.pdf
2	http://cbseacademic.nic.in/web_material/ValueEdu/Value%20Education%20Kits.pdf
3	https://www.verywellmind.com/personality-development-2795425

4	https://trudreadz.com/2019/09/10/blind-faith-in-religion-destroys-our-ability-to-critically-think-for-ourselves/

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	2				1	2
CO2	1		1			2
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.						

Assessment
The assessment is based on MSE, ISE and ESE. MSE shall be typically on modules 1 to 3. ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Assessment Plan based on Bloom's Taxonomy Level				
Bloom's Taxonomy Level	**MSE**	**ISE**	**ESE**	**Total**
Remember	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Understand	To be used minimum	To be used minimum	To be used minimum	To be used minimum
Apply	10	10	20	**40**
Analyze	10	5	10	**25**
Evaluate	10	5	10	**25**
Create			10	**10**
Total	**30**	**20**	**50**	**100**