



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

**II B.TECH.**

<b>SEMESTER - III</b>							
S.No.	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	20A54301	Probability and Statistics for Civil Engineering	BS	3	0	0	3
2.	20A01301	Advanced Strength of Materials	PC	3	0	0	3
3.	20A01302T	Fluid Mechanics and Hydraulic Machines	PC	3	0	0	3
4.	20A01303T	Surveying	PC	3	0	0	3
5.	20A52301	<b>Humanities Elective– I</b> Managerial Economics & Financial Analysis	HS	3	0	0	3
	20A52302	Organizational Behavior					
	20A52303	Business Environment					
6.	20A01304	Basic Civil Engineering Laboratory	PC	0	0	3	1.5
7.	20A01302P	Fluid Mechanics and Hydraulic Machines Lab	PC	0	0	3	1.5
8.	20A01303P	Surveying Lab	PC	0	0	3	1.5
9.	20A05305	<b>Skill oriented course - I</b> Application development with Python	SC	1	0	2	2
10.	20A52201	<b>Mandatory noncredit course – II</b> Universal Human Values	MC	3	0	0	0
11.	20A99301	NSS/NCC/NSO Activities	-	-	-	2	0
<b>Total</b>							<b>21.5</b>

<b>SEMESTER - IV</b>							
S.No.	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	20A54401	Mathematical Modeling & Optimization Techniques	BS	3	0	0	3
2.	20A01401T	Engineering Geology	ES	3	0	0	3
3.	20A01402	Structural Analysis – I	PC	3	0	0	3
4.	20A01403T	Concrete Technology	PC	3	0	0	3
5.	20A01404T	Environmental Engineering - I	PC	3	0	0	3
6.	20A01401P	Engineering Geology Lab	ES	0	0	3	1.5
7.	20A01405	Concrete Materials Lab	PC	0	0	3	1.5
8.	20A01404P	Environmental Engineering Lab	PC	0	0	3	1.5
9.	20A52401	<b>Skill oriented course – II</b> Soft Skills	SC	1	0	2	2
10.	20A99401	<b>Mandatory non-credit course - III</b> Design Thinking for Innovation	MC	2	1	0	0
<b>Total</b>							<b>21.5</b>
Mandatory Community Service Internship for 6 weeks duration during Summer Vacation							



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

**Note:**

1. Eligible and interested students can register either for Honors or for a Minor in IV Semester as per the guidelines issued by the University
2. Students shall register for NCC/NSS/NSO activities and will be required to participate in an activity for two hours in a week during third semester.
3. Lateral entry students shall undergo a bridge course in Mathematics during third semester



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	Mathematical Modeling & Optimization Techniques	L	T	P	C
20A54401		3	0	0	3
Pre-requisite	NIL	Semester		IV	
<b>Course Objectives:</b>					
This course enables the students to classify and formulate real-life problem for modeling as optimization problem					
<b>Course Outcomes (CO):</b>					
After the completion of Course, students will be able to					
<ol style="list-style-type: none"> <li>1. Know about the classifications and stages of mathematical modeling</li> <li>2. Understand building of mathematical models</li> <li>3. Study the behavior of mathematical models</li> <li>4. formulate a linear programming problem and solve it by various methods</li> <li>5. give an optimal solution in assignment jobs, give transportation of items from sources to destinations.</li> </ol>					
<b>UNIT - I</b>	<b>Introduction to Modelling, Building Models, Studying Models</b>	<b>8 Hrs</b>			
What is mathematical modelling? What objectives can modelling achieve? Classifications of models Stages of modelling . Systems analysis- Making assumptions- Flow diagrams- Choosing mathematical equations.					
<b>UNIT - II</b>	<b>Studying Models</b>	<b>8 Hrs</b>			
Equations from the literature- Analogies from physics-Data exploration, Dimensionless form - Asymptotic behaviour- Sensitivity analysis - Modelling model output					
<b>UNIT - III</b>	<b>Linear programming problems(LPP)</b>	<b>9 Hrs</b>			
Linear programming problems (LPP)-Graphical method-Simplex method-Big M Method-Dual simplex method.					
<b>UNIT - IV</b>	<b>Transportation&amp;Assignment Problem</b>	<b>11 Hrs</b>			
Formulation of transportation model, Basic feasible solution using different methods, Optimality Methods, Unbalanced transportation problem, Degeneracy in transportation problems, Applications of Transportation problems. Assignment Problem: Formulation, unbalanced assignment problem, Travelling salesman problem.					
<b>UNIT - V</b>	<b>Game Theory</b>	<b>11 Hrs</b>			
Formulation of games, Two person-Zero sum game, Mini max and Max min Principle, games with and without saddle point, Rules of dominance, Solving a 2/2 game using graphical method.					
<b>Textbooks:</b>					
<ol style="list-style-type: none"> <li>1. Mathematical Modeling: by Majid Jaber-Douraki and Seyed M. Moghadas</li> <li>2. Operations Research , S.D. Sharma.</li> </ol>					
<b>Reference Books:</b>					
<ol style="list-style-type: none"> <li>1. Mathematical Models in Applied Mechanics A.B. Tayler</li> <li>2. Operations Research, An Introduction, Hamdy A. Taha, Pearson publishers.</li> </ol>					
<b>Online Learning Resources:</b>					
<a href="https://people.maths.bris.ac.uk/~madjl/course_text.pdf">https://people.maths.bris.ac.uk/~madjl/course_text.pdf</a>					



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	Engineering Geology		L	T	P	C
20A01401T			3	0	0	3
Pre-requisite	NIL	Semester	IV			
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>• To understand weathering process and mass movement</li> <li>• To distinguish geological formations</li> <li>• To identify geological structures and process of rock mass quality.</li> <li>• To identify subsurface information and groundwater potential sites through geophysical investigations</li> <li>• To apply geological principles of mitigation of natural hazards and select sites for dams and tunnels</li> </ul>						
<b>Course Outcomes (CO):</b>						
At the end of the course student will be able to						
<ul style="list-style-type: none"> <li>• Gain basic knowledge on characteristics of rocks and</li> <li>• Gain basic knowledge on characteristics of minerals.</li> <li>• Identify and differentiate rocks using geological classification.</li> <li>• Carry out geo physical investigations for infrastructural projects.</li> <li>• Apply concepts of structural geology for civil engineering structures.</li> </ul>						
UNIT - I	<b>PHYSICAL GEOLOGY</b>				Lecture Hrs	
Geology in civil engineering – branches of geology – structure of earth and its composition weathering of rocks – scale of weathering – soils – landforms and processes associated with river, wind, groundwater and sea – relevance to civil engineering. Plate tectonics – Earth quakes – Seismic zones in India.						
UNIT - II	<b>MINEROLOGY</b>				Lecture Hrs	
Physical properties of minerals – Quartz group, Feldspar group, Pyroxene – hypersthene and augite, Amphibole – hornblende, Mica – muscovite and biotite, Calcite, Gypsum and Clay minerals - Ore minerals - Iron ores; pyrite; Chlorite						
UNIT - III	<b>PETROLOGY</b>				Lecture Hrs	
Classification of rocks, distinction between Igneous, Sedimentary and Metamorphic rocks. Engineering properties of rocks. Description, occurrence, engineering properties, distribution and uses of Granite, Dolerite, Basalt, Sandstone, Limestone, Laterite, Shale, Quartzite, Marble, Slate, Gneiss and Schist.						
UNIT - IV	<b>STRUCTURAL GEOLOGY AND GEOPHYSICAL METHODS</b>				Lecture Hrs	
Geological maps – attitude of beds, study of structures – folds, faults and joints – relevance to civil engineering. Geophysical methods – Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods and Geothermal method. Electrical resistivity methods, and seismic refraction methods.						
UNIT - V	<b>APPLICATION OF GEOLOGICAL INVESTIGATIONS</b>				Lecture Hrs	
Remote sensing for civil engineering applications; site selection for dams and tunnels – Geological conditions necessary for design and construction of Dams, Reservoirs, Tunnels, and Road cuttings – Hydrogeological investigations and mining – Coastal protection structures. Investigation of Landslides, causes and mitigation.						
<b>Textbooks:</b>						
<ol style="list-style-type: none"> <li>1. N. ChennaKesavulu, “Text Book of Engineering Geology”, 2nd Edition (2009), Macmillan Publishers India.</li> <li>2. Vasudev Kanithi, “Engineering Geology”, Universities Press Pvt Ltd, Hyderabad. 2012.</li> </ol>						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Reference Books:

1. Parbin Singh, “Engineering and General Geology”, 8th Edition (2010), S K Kataria& Sons.
2. D.Venkata Reddy, “Engineering Geology, Second edition”, Vikas Publishing house, Pvt, Ltd Richard E. Goodman, “Engineering Geology, Rock in Engineering Construction”, John Wiley & Sons, Inc. 1993.
3. S.K.Duggal, H.K Pandey, N.Rawal, “Engineering Geology”, Mc.Graw Hill Education (India) Pvt. Ltd
4. Billings, M. P., “Structural Geology”, Prentice-Hall India, 1974, New Delhi

Online Learning Resources:

1. <https://nptel.ac.in/courses/105/105/105105106/>
2. <https://freevidelectures.com/course/87/engineering-geology>
3. <https://www.edx.org/course/geology-and-engineering-geology>
4. <https://courses.lumenlearning.com/geo/chapter/reading-the-branches-of-geology/>
5. <https://www.coursera.org/courses?query=geology>



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	STRUCTURAL ANALYSIS -I		L	T	P	C
20A01402			3	0	0	3
Pre-requisite	Engineering Mechanics	Semester	IV			
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>• To demonstrate analytical methods for determining strength &amp; stiffness and assess stability of structural members.</li> <li>• To enable the student analyze indeterminate trusses</li> <li>• To make the student to understand the analysis procedures for analyzing fixed and Continuous beams.</li> <li>• To enable the student to undergo analysis procedure using slope deflection method and moment distribution method.</li> <li>• To enable the student to analyze the two hinged and three hinged arches</li> </ul>						
<b>Course Outcomes (CO):</b>						
<ul style="list-style-type: none"> <li>• Determine deflection at any point on a beam under simple and combined loads</li> <li>• Apply energy theorems for analysis of indeterminate structures</li> <li>• Analyze indeterminate structures with yielding of supports</li> <li>• Analyze beams and portal frames using slope deflection and moment distribution methods</li> <li>• Analyze bending moment, normal thrust and radial shear in the arches</li> </ul>						
<b>UNIT - I</b>	<b>Basic Analysis of Indeterminate Structures</b>					
Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear force – Castigliano’s first theorem - Deflections of simple beams and pin jointed trusses - Indeterminate Structural Analysis – Determination of static and kinematic indeterminacies – Solution of trusses up to two degrees of internal and external indeterminacy – Castigliano’s second theorem.						
<b>UNIT - II</b>	<b>Fixed Beams &amp; Continuous Beams</b>					
Introduction to statically indeterminate beams- theorem of three moments-uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads – Shear force and Bending moment diagrams –effect of sinking of support, effect of rotation of a support.						
<b>UNIT - III</b>	<b>Slope-Deflection Method</b>					
Introduction- derivation of slope deflection equation- application to continuous beams with and without settlement of supports- Analysis of single bay, single storey, portal frame including side sway.						
<b>UNIT - IV</b>	<b>Moment Distribution Method</b>					
Introduction to moment distribution method- application to continuous beams with and without settlement of supports. Analysis of single storey ,portal frames – including Sway						
<b>UNIT - V</b>	<b>Arches</b>					
Introduction- hinges-transfer of load to arches-linear arch-hinges in the arch-arch action-Horizontal force – three hinged arches – circular arches – springs at different level-Two hinged arches- two hinged circular arches – fixed arches (only theory) - Temperature stresses in arches.						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

<b>Textbooks:</b>
<ol style="list-style-type: none"> <li>1. C. S. Reddy, “Basic Structural Analysis”, Tata McGraw Hill</li> <li>2. S. Ramamurtham, “Theory of Structures”, Dhanpat Rai Publishing Company (p) Ltd, 2009</li> </ol>
<b>Reference Books:</b>
<ol style="list-style-type: none"> <li>1. Timoshenko &amp; Young, “Theory of Structures”, Tata McGraw Hill</li> <li>2. S.S. Bhavikatti, “Structural analysis”, Volume 1 and 2, Vikas publishing house pvt. Ltd.</li> <li>3. Dr.Vaidyanathan, Dr.P.Perumal, “Comprehensive structural analysis”, Vol-II, Laxmi Publications (P) Ltd.</li> <li>4. Junarkar S. B., “Structural Mechanics”, Vol I &amp; II, Charotar Publishers</li> </ol>
<b>Online Learning Resources:</b>
<ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/105/105/105105166/">https://nptel.ac.in/courses/105/105/105105166/</a></li> <li>2. <a href="https://ocw.mit.edu/courses/civil-and-environmental-engineering/1-571-structural-analysis-and-control-spring-2004/syllabus/">https://ocw.mit.edu/courses/civil-and-environmental-engineering/1-571-structural-analysis-and-control-spring-2004/syllabus/</a></li> <li>3. <a href="https://www.udemy.com/course/statics-for-engineering-undergrads/?utm_source=adwords&amp;utm_medium=udemyads&amp;utm_campaign=LongTail_la.EN_cc.INDIA&amp;utm_content=deal4584&amp;utm_term=.ag_118445032537.ad_533094112755.kw.de_c.dm.pl.ti_dsa-1212271230479.li_9040221.pd.&amp;matchtype=b&amp;gclid=CjwKCAjw9aiBhA1EiwAJ_GTSi9B1-IRzq7FUiND1u-mrYI7l0tzc3Tv35FKdG1Tpl-WkGjHlmbxoC920QAvD_BwE">https://www.udemy.com/course/statics-for-engineering-undergrads/?utm_source=adwords&amp;utm_medium=udemyads&amp;utm_campaign=LongTail_la.EN_cc.INDIA&amp;utm_content=deal4584&amp;utm_term=.ag_118445032537.ad_533094112755.kw.de_c.dm.pl.ti_dsa-1212271230479.li_9040221.pd.&amp;matchtype=b&amp;gclid=CjwKCAjw9aiBhA1EiwAJ_GTSi9B1-IRzq7FUiND1u-mrYI7l0tzc3Tv35FKdG1Tpl-WkGjHlmbxoC920QAvD_BwE</a></li> </ol>



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	Concrete Technology		L	T	P	C
20A01403T			3	0	0	3
Pre-requisite	NIL	Semester	IV			
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>To explain the functional role of ingredients of concrete and apply this knowledge to mix design philosophy</li> <li>To develop fundamental knowledge in the fresh and hardened properties of concrete</li> <li>To inculcate the testing methodology to evaluate the properties of concrete during fresh and hardened stage</li> <li>To impart the knowledge on the behavior of concrete with response to stresses developed.</li> <li>To impart the knowledge on the special concretes and design a concrete mix which fulfils the required properties for fresh and hardened concrete</li> </ul>						
<b>Course Outcomes (CO):</b>						
At the end of the course student is able to						
<ul style="list-style-type: none"> <li>Understand various ingredients of concrete and their role.</li> <li>Examine knowledge on the fresh and hardened properties of concrete.</li> <li>Examine the the behavior of concrete with response to stresses developed</li> <li>Design concrete mixes using various methods.</li> <li>Perceive special concretes for accomplishing performance levels.</li> </ul>						
UNIT - I	Ingredients of concrete					
Cement-chemical composition-hydration process-Bogue's compound-Tests on properties of cement-Types of cement - I.S. Specifications. Aggregates- classification of aggregate – tests on properties of aggregates - characteristics of aggregate - I.S. Specifications. Water-quality of water - characteristics of water - I.S. Specifications. Admixtures – classification of chemical admixtures – properties and limitations – classification of mineral admixtures – properties and limitations - I.S. Specifications.						
UNIT - II	Properties of concrete					
Fresh concrete: Mixing of concrete-workability-factors influencing workability-measurement of workability for conventional concrete (Slump Cone, Compaction Factor and Vee-Bee test) & SCC (V-Funnel, L-Box, U- Box, Slump Flow and J-Ring). Hardened concrete: Water/Cement Ratio(Abram's Law)-Gel Space Ratio-tests on hardened concrete -Destructive Tests (Compression, Split Tensile and Flexural)-Semi Destructive Tests (Core Cutter and Pull out test) and Non Destructive Tests (Rebound Hammer-UPV - Radiological methods).						
UNIT - III	Elasticity, Shrinkage and Creep					
Curing of concrete -methods of curing-effects of improper curing-self curing-Modulus of Elasticity-Poisson's Ratio-Dynamic Modulus of Elasticity- Shrinkage and various types - Factors Affecting Shrinkage-Moisture Movement-Creep of Concrete-Factors Influencing Creep.						
UNIT - IV	Concrete Mix Design					
Proportioning of Concrete Mixes-factors influencing - Road Note. No. 4 and IS Code Methods- IS 456 provisions on Durability-Quality Control and Statistical Methods – Mix Design of : High Strength concrete – High Performance Concrete.						
UNIT - V	Special Concretes					
Introduction – Mix Design – Applications of : Light Weight Concretes - Cellular Concrete - No Fines Concrete-High Density Concrete – Fiber Reinforced Concrete-Polymer Concrete-Self Compacting Concrete .						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Textbooks:
<ol style="list-style-type: none"> <li>1. A. M. Neville, "Properties of Concrete", Pearson Publication – 4th Edition</li> <li>2. M.S. Shetty, A. K. Jain, "Concrete Technology Theory and Practice", S. Chand and Company Limited, New Delhi</li> </ol>
Reference Books:
<ol style="list-style-type: none"> <li>1. M. L. Gambhir, "Concrete Technology", Tata Mc. Graw Hill Publishers, New Delhi</li> <li>2. N. Krishna Raju, "Design of Concrete Mixes", CBS Publishers.</li> <li>3. P. K. Mehta And J. M. Monteiro, "Concrete: Micro Structure, Properties and Materials" Mc-Graw Hill Publishers</li> <li>4. J. Prasad, C.G.K. Nair, "Non-Destructive Test and Evaluation of Materials", Tata Mcgraw Hill Publishers, New Delhi</li> <li>5. Newman, John &amp; Choo, Ban Sang. "ADVANCED CONCRETE TECHNOLOGY- Constituent Materials" Elsevier 2003.</li> </ol>
Online Learning Resources:
<ol style="list-style-type: none"> <li>1. <a href="https://onlinecourses.nptel.ac.in/noc19_ce20/preview">https://onlinecourses.nptel.ac.in/noc19_ce20/preview</a></li> <li>2. <a href="https://ocw.mit.edu/courses/civil-and-environmental-engineering/1-054-mechanics-and-design-of-concrete-structures-spring-2004/download-course-materials/">https://ocw.mit.edu/courses/civil-and-environmental-engineering/1-054-mechanics-and-design-of-concrete-structures-spring-2004/download-course-materials/</a></li> <li>3. <a href="https://www.udemy.com/course/properties-of-fresh-hardened-concrete/?utm_source=adwords&amp;utm_medium=udemyads&amp;utm_campaign=DSA_Catchall_la.EN_cc.INDIA&amp;utm_content=deal4584&amp;utm_term=.ag_82569850245_.ad_533220805574_.kw_.de_c_.dm_.pl_.ti_dsa-52949608673_.li_9040221_.pd_.&amp;matchtype=b&amp;gclid=CjwKCAjwmK6IBhBqEiwAocMc8h6K0s2ri4I8hJYzyJ3MytwTDb7ZIC8kzKe-n6t-649itkeOUSg4eRoChA8QAvD_BwE">https://www.udemy.com/course/properties-of-fresh-hardened-concrete/?utm_source=adwords&amp;utm_medium=udemyads&amp;utm_campaign=DSA_Catchall_la.EN_cc.INDIA&amp;utm_content=deal4584&amp;utm_term=.ag_82569850245_.ad_533220805574_.kw_.de_c_.dm_.pl_.ti_dsa-52949608673_.li_9040221_.pd_.&amp;matchtype=b&amp;gclid=CjwKCAjwmK6IBhBqEiwAocMc8h6K0s2ri4I8hJYzyJ3MytwTDb7ZIC8kzKe-n6t-649itkeOUSg4eRoChA8QAvD_BwE</a></li> </ol>



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	Environmental Engineering - I		L	T	P	C
20A01404T			3	0	0	3
Pre-requisite	NIL	Semester	IV			
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>• To teach requirements of water and its treatment.</li> <li>• To impart knowledge on sewage treatment methodologies.</li> <li>• To provide facts on Air pollution and control.</li> <li>• To enable with design concepts of wastewater treatment UNITs</li> <li>• To throw light on importance of plumbing.</li> <li>•</li> </ul>						
<b>Course Outcomes (CO):</b>						
At the end of the course, the student will be able to: <ul style="list-style-type: none"> <li>• Understand about quality of water and purification process</li> <li>• Select appropriate technique for treatment of wastewater.</li> <li>• Assess the impact of air pollution</li> <li>• Understand consequences of solid waste and its management</li> <li>• Design domestic plumbing systems</li> </ul>						
UNIT - I	Water quality and treatment:					
Water quality: Sources of Water and quality issues, water quality requirement for different beneficial uses, Water quality standards, water quality indices, water safety plans, Water Supply systems, Need for planned water supply schemes, Water demand industrial and agricultural water requirements, Components of water supply system; Transmission of water, Distribution system, Various valves used in W/S systems, service reservoirs and design. Water Treatment: aeration, sedimentation, coagulation flocculation, filtration, disinfection, advanced treatments like adsorption, ion exchange, membrane processes						
UNIT – II	Sewage and Treatment					
Domestic and Storm water, Quantity of Sewage, Sewage flow variations. Conveyance of sewage-Sewers, shapes design parameters, operation and maintenance of sewers, Sewage pumping; Sewerage, Sewer appurtenances, Design of sewerage systems. Small bore systems, Storm Water-Quantification and design of Storm water; Sewage and Sullage, Pollution due to improper disposal of sewage, National River cleaning plans, Wastewater treatment – COD & BOD- aerobic and anaerobic treatment systems, suspended and attached growth systems, recycling of sewage – quality requirements for various purposes.						
UNIT - III	Air Pollution					
Composition and properties of air, Quantification of air pollutants, Monitoring of air pollutants, Air pollution- Occupational hazards, Urban air pollution automobile pollution, Chemistry of combustion, Automobile engines, quality of fuel, operating conditions and interrelationship. Air quality standards, Control measures for Air pollution, construction and limitations.						
UNIT - IV	Solid Waste Management					
Municipal solid waste-Composition - chemical and physical parameters - Collection, transport, treatment and disposal. waste from commercial establishments and other urban zonesconstruction activities - biomedical wastes, Effects of solid waste on environment. Disposal of solid waste-Disposal methods- Integrated solid waste management.						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

<b>UNIT - V</b>	<b>Domestic Plumbing</b>
Types of home plumbing systems for water supply and waste water disposal, high rise building plumbing-Pressure reducing valves, Break pressure tanks, Storage tanks, Building drainage for high rise buildings, various kinds of fixtures and fittings. Role of Government authorities in water supply, sewerage disposal	
<b>Textbooks:</b>	
<ol style="list-style-type: none"> <li>1. G. S. Birdi, "Water supply and sanitary Engineering", Dhanpat Rai &amp; Sons Publishers.</li> <li>2. Peavy, H.S, Rowe, D. R. Tchobanoglous, "Environmental Engineering", Mc-Graw – Hill International Editions, New York 1985.</li> </ol>	
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. B.C. Punmia, Ashok Jain &amp; Arun Jain, "Water Supply Engineering", Vol. 1, Waste water Engineering, Vol. II, Laxmi Publications Pvt. Ltd, New Delhi.</li> <li>2. MetCalf and Eddy, "Wastewater Engineering", Treatment, Disposal and Reuse, Tata McGraw- Hill, New Delhi.</li> <li>3. S. M. Patil, "Plumbing Engineering Theory, Design and Practice", 1999.</li> <li>4. K. N. Duggal, "Elements of Environmental Engineering", S. Chand Publishers.</li> </ol>	
<b>Online Learning Resources:</b>	
<ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/103/107/103107084/">https://nptel.ac.in/courses/103/107/103107084/</a></li> <li>2. <a href="https://ocw.mit.edu/courses/environment-courses/">https://ocw.mit.edu/courses/environment-courses/</a></li> <li>3. <a href="https://learningpath.org/articles/Free Online Environmental Engineering Courses from Top Universities.html">https://learningpath.org/articles/Free Online Environmental Engineering Courses from Top Universities.html</a></li> <li>4. <a href="https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ge22/">https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ge22/</a></li> </ol>	



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	ENGINEERING GEOLOGY LAB		L	T	P	C
20A01401P			0	0	3	1.5
Pre-requisite	NIL	Semester	IV			
<b>Course Objectives:</b>						
The object of the course is to enable the students to identify the physical characteristics various rocks						
<b>Course Outcomes (CO):</b>						
At the end of the course the students will be able to classify various types of rocks, their properties and they will be familiar with interpretation of geological maps.						
<b>List of Experiments:</b>						
<ol style="list-style-type: none"> <li>1. Physical properties of minerals: Mega-scopic identification of Rock forming minerals – Quartz group, Feldspar group,</li> <li>2. Identification of Rock forming minerals Garnet group, Mica group</li> <li>3. Physical properties of minerals: Mega-scopic identification of Talc, Chlorite, Olivine, Kyanite, Asbestos, Tourmelene, Calcite, Gypsum, etc...</li> <li>4. Physical properties of minerals: Mega-scopic identification of Ore forming minerals – Magnetite, Hematite, Pyrite, Pyralusite, Graphite, Chromite, etc...</li> <li>5. Megascopic description and identification of Igneous rocks – Types of Granite, Pegmatite, Gabbro, Dolerite, Syenite, Granite Poryphery, Basalt, etc...</li> <li>6. Megascopic description and identification of Sedimentary rocks – Sand stone, Ferruginous sand stone, Lime stone, Shale, Laterite, Conglamorate, etc...</li> <li>7. Megascopic description and identification of Metamorphic rocks – Biotite – Granite Gneiss, Slate, Muscovite &amp; Biotiteschist, Marble, Khondalite, etc...</li> <li>8. Interpretation and drawing of sections for geological maps showing tilted beds</li> <li>9. Interpretation and drawing of sections for geological maps showing faults,</li> <li>10. Interpretation and drawing of sections for geological maps showing unconformities etc.</li> <li>11. Simple Structural Geology problems.</li> <li>12. Strength of the rock using laboratory tests.</li> </ol>						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	Concrete Materials Lab		L	T	P	C
20A01405			0	0	3	1.5
Pre-requisite	NIL	Semester	IV			
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>• To find the various physical characteristics of cement, coarse and fine aggregates</li> <li>• To find the various properties of green and hardened concrete.</li> </ul>						
<b>Course Outcomes (CO):</b>						
At the end of the course, the student will be able						
<ul style="list-style-type: none"> <li>• To find the characteristics of fine and coarse aggregates</li> <li>• To understand the workability behaviour of concrete through various tests</li> </ul>						
<b>List of Experiments:</b>						
<ol style="list-style-type: none"> <li>1. Grading Curve of Coarse aggregates</li> <li>2. Grading Curve of Fine aggregates</li> <li>3. Bulking of Fine aggregate</li> <li>4. Specific gravity of coarse aggregate</li> <li>5. Specific gravity of Fine aggregate</li> <li>6. Specific gravity of Cement</li> <li>7. fineness of Cement</li> <li>8. Normal Consistency of Cement</li> <li>9. Initial and final setting times of Cement</li> <li>10. Soundness test of Cement</li> <li>11. Compressive Strength test of Cement</li> <li>12. Slump, Compaction factor and Vee-Bee time tests on concrete.</li> <li>13. Compressive strength of concrete.</li> <li>14. Split tensile strength of concrete</li> <li>15. Non destructive tests on concrete (any two)</li> </ol>						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
 (Established by Govt. of A.P., ACT No.30 of 2008)  
 ANANTHAPURAMU – 515 002 (A.P) INDIA

**CIVIL ENGINEERING**

Course Code	ENVIRONMENTAL ENGINEERING LAB		L	T	P	C
20A01404P			0	0	3	1.5
Pre-requisite	NIL	Semester	IV			
<b>Course Objectives:</b>						
The object of the course is to enable the students to identify the characteristics of water sample						
<b>Course Outcomes (CO):</b>						
At the end of the course, the student will be able to Understand about quality of water standards						
<b>List of Experiments:</b>						
<ol style="list-style-type: none"> <li>1. Determination of pH and Electrical Conductivity (Salinity) of Water and Soil.</li> <li>2. Determination and estimation of Total Hardness–Calcium &amp; Magnesium.</li> <li>3. Determination of Alkalinity/Acidity</li> <li>4. Determination of Chlorides in water and soil</li> <li>5. Determination and Estimation of total solids, organic solids and inorganic solids and settleable solids by Imhoff Cone.</li> <li>6. Determination of Iron.</li> <li>7. Determination of Dissolved Oxygen with D.O. Meter &amp; Wrinklers Method and B.O.D.</li> <li>8. Determination of N, P, K values in solid waste</li> <li>9. Physical parameters – Temperature, Colour, Odour, Turbidity, Taste.</li> <li>10. Determination of C.O.D.</li> <li>11. Determination of Optimum coagulant dose.</li> <li>12. Determination of Chlorine demand.</li> <li>13. Presumptive Coliform test.</li> </ol>						
<b>References:</b>						
1.G. S. Birdi “Water supply and sanitary Engineering”, Dhanpat Rai & Sons Publishers. 2.Peavy, H.S, Rowe, D. R. Tchobanoglous, “Environmental Engineering”, Mc-Graw –Hill International Editions, New York 1985						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

Course Code	Soft Skills		L	T	P	C
20A52401			1	0	2	2
Pre-requisite	NIL	Semester	IV			
Course Objectives:						
<ul style="list-style-type: none"> <li>• To encourage all round development of the students by focusing on soft skills</li> <li>• To make the students aware of critical thinking and problem-solving skills</li> <li>• To develop leadership skills and organizational skills through group activities</li> <li>• To function effectively with heterogeneous teams</li> </ul>						
<b>Course Outcomes (CO):</b>						
By the end of the program students should be able to						
<ul style="list-style-type: none"> <li>• Memorize various elements of effective communicative skills</li> <li>• Interpret people at the emotional level through emotional intelligence</li> <li>• apply critical thinking skills in problem solving</li> <li>• analyse the needs of an organization for team building</li> <li>• Judge the situation and take necessary decisions as a leader</li> <li>• Develop social and work-life skills as well as personal and emotional well-being</li> </ul>						
<b>UNIT – I</b>	<b>Soft Skills &amp; Communication Skills</b>				<b>10 Hrs</b>	
Introduction, meaning, significance of soft skills – definition, significance, types of communication skills - Intrapersonal & Inter-personal skills - Verbal and Non-verbal Communication						
<b>Activities:</b>						
<b>Intrapersonal Skills-</b> Narration about self- strengths and weaknesses- clarity of thought – self-expression – articulating with felicity (The facilitator can guide the participants before the activity citing examples from the lives of the great, anecdotes and literary sources)						
<b>Interpersonal Skills-</b> Group Discussion – Debate – Team Tasks - Book and film Reviews by groups - Group leader presenting views (non- controversial and secular) on contemporary issues or on a given topic.						
<b>Verbal Communication-</b> Oral Presentations- Extempore- brief addresses and speeches- convincing- negotiating- agreeing and disagreeing with professional grace.						
<b>Non-verbal communication</b> – Public speaking – Mock interviews – presentations with an objective to identify non- verbal clues and remedy the lapses on observation						
<b>UNIT – II</b>	<b>Critical Thinking</b>				<b>10 Hrs</b>	
Active Listening – Observation – Curiosity – Introspection – Analytical Thinking – Open-mindedness – Creative Thinking						
<b>Activities:</b>						
Gathering information and statistics on a topic - sequencing – assorting – reasoning – critiquing issues –placing the problem – finding the root cause - seeking viable solution – judging with rationale – evaluating the views of others - Case Study, Story Analysis						
<b>UNIT – III</b>	<b>Problem Solving &amp; Decision Making</b>				<b>10 Hrs</b>	
Meaning & features of Problem Solving – Managing Conflict – Conflict resolution – Methods of decision making – Effective decision making in teams – Methods & Styles						
<b>Activities:</b>						
Placing a problem which involves conflict of interests, choice and views – formulating the problem – exploring solutions by proper reasoning – Discussion on important professional, career and organizational decisions and initiate debate on the appropriateness of the decision. Case Study & Group Discussion						



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

UNIT – IV	Emotional Intelligence & Stress Management	10 Hrs
Managing Emotions – Thinking before Reacting – Empathy for Others – Self-awareness – Self-Regulation – Stress factors – Controlling Stress – Tips  <b>Activities:</b> Providing situations for the participants to express emotions such as happiness, enthusiasm, gratitude, sympathy, and confidence, compassion in the form of written or oral presentations. Providing opportunities for the participants to narrate certain crisis and stress –ridden situations caused by failure, anger, jealousy, resentment and frustration in the form of written and oral presentation, Organizing Debates		
UNIT – V	Leadership Skills	10 Hrs
Team-Building – Decision-Making – Accountability – Planning – Public Speaking – Motivation – Risk-Taking - Team Building - Time Management  <b>Activities:</b> Forming group with a consensus among the participants- choosing a leader- encouraging the group members to express views on leadership- democratic attitude- sense of sacrifice – sense of adjustment – vision – accommodating nature- eliciting views on successes and failures of leadership using the past knowledge and experience of the participants, Public Speaking, Activities on Time Management, Motivation, Decision Making, Group discussion etc. <b>NOTE-:</b> 1. The facilitator can guide the participants before the activity citing examples from the lives of the great, anecdotes, epics, scriptures, autobiographies and literary sources which bear true relevance to the prescribed skill. 2. Case studies may be given wherever feasible for example for Decision Making- The decision of King Lear or for good Leadership – Mahendar Singh Dhoni etc.		
<b>Textbooks:</b>		
1. Personality Development and Soft Skills (English, Paperback, Mitra Barun K.) Publisher: Oxford University Press; Pap/Cdr edition (July 22, 2012) 2. Personality Development and Soft Skills: Preparing for Tomorrow, <u>Dr Shikha Kapoor</u> Publisher : I K International Publishing House; 0 edition (February 28, 2018)		
<b>Reference Books:</b>		
1. Soft skills: personality development for life success by Prashant Sharma, BPB publications 2018. 2. Soft Skills By Alex K. Published by S.Chand 3. Soft Skills: An Integrated Approach to Maximise Personality Gajendra Singh Chauhan, Sangeetha Sharma Published by Wiley. 4. Communication Skills and Soft Skills (Hardcover, A. Sharma) Publisher: Yking books 5. SOFT SKILLS for a BIG IMPACT (English, Paperback, RenuShorey) Publisher: Notion Press 6. Life Skills Paperback English Dr. Rajiv Kumar Jain, Dr. Usha Jain Publisher: Vayu Education of India		
<b>Online Learning Resources:</b>		
1. <a href="https://youtu.be/DUIsNJtg2L8?list=PLLy_2iUCG87CQhELCYtvXh0E_y-bOO1_q">https://youtu.be/DUIsNJtg2L8?list=PLLy_2iUCG87CQhELCYtvXh0E_y-bOO1_q</a> 2. <a href="https://youtu.be/xBaLgJZ0t6A?list=PLzf4HHlsQFwJZel_j2PUy0pwjVUgj7KlJ">https://youtu.be/xBaLgJZ0t6A?list=PLzf4HHlsQFwJZel_j2PUy0pwjVUgj7KlJ</a> 3. <a href="https://youtu.be/-Y-R9hDI7IU">https://youtu.be/-Y-R9hDI7IU</a> 4. <a href="https://youtu.be/gkLsn4ddmTs">https://youtu.be/gkLsn4ddmTs</a> 5. <a href="https://youtu.be/2bf9K2rRWwo">https://youtu.be/2bf9K2rRWwo</a> 6. <a href="https://youtu.be/FchfE3c2jzc">https://youtu.be/FchfE3c2jzc</a>		



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

--

Course Code	Design Thinking for Innovation (Common to All branches of Engineering)	L	T	P	C
20A99401		2	1	0	0
<b>Pre-requisite</b>	NIL	<b>Semester</b>		IV	
<b>Course Objectives:</b>					
The objective of this course is to familiarize students with design thinking process as a tool for breakthrough innovation. It aims to equip students with design thinking skills and ignite the minds to create innovative ideas, develop solutions for real-time problems.					
<b>Course Outcomes (CO):</b>					
<ul style="list-style-type: none"> <li>● Define the concepts related to design thinking.</li> <li>● Explain the fundamentals of Design Thinking and innovation</li> <li>● Apply the design thinking techniques for solving problems in various sectors.</li> <li>● Analyse to work in a multidisciplinary environment</li> <li>● Evaluate the value of creativity</li> <li>● Formulate specific problem statements of real time issues</li> </ul>					
<b>UNIT - I</b>	<b>Introduction to Design Thinking</b>				<b>10 Hrs</b>
Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.					
<b>UNIT - II</b>	<b>Design Thinking Process</b>				<b>10 Hrs</b>
Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brain storming, product development					
<b>Activity:</b> Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.					
<b>UNIT - III</b>	<b>Innovation</b>				<b>8 Hrs</b>
Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.					
<b>Activity:</b> Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.					
<b>UNIT - IV</b>	<b>Product Design</b>				<b>8 Hrs</b>
Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.					
<b>Activity:</b> Importance of modelling, how to set specifications, Explaining their own product design.					
<b>UNIT - V</b>	<b>Design Thinking in Business Processes</b>				<b>10 Hrs</b>
Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.					



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

**Activity:** How to market our own product, About maintenance, Reliability and plan for startup.

**Textbooks:**

1. Change by design, Tim Brown, Harper Bollins (2009)
2. Design Thinking for Strategic Innovation, Idris Mootee, 2013, John Wiley & Sons.

**Reference Books:**

1. Design Thinking in the Classroom by David Lee, Ulysses press
2. Design the Future, by Shrrutin N Shetty, Norton Press
3. Universal principles of design- William lidwell, kritinaholden, Jill butter.
4. The era of open innovation – chesbrough.H

**Online Learning Resources:**

<https://nptel.ac.in/courses/110/106/110106124/>  
<https://nptel.ac.in/courses/109/104/109104109/>  
[https://swayam.gov.in/nd1\\_noc19\\_mg60/preview](https://swayam.gov.in/nd1_noc19_mg60/preview)



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
(Established by Govt. of A.P., ACT No.30 of 2008)  
ANANTHAPURAMU – 515 002 (A.P) INDIA

**CIVIL ENGINEERING**

**COMMUNITY SERVICE PROJECT**

**.....Experiential learning through community engagement**

**Introduction**

- Community Service Project is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning and community development
- Community Service Project involves students in community development and service activities and applies the experience to personal and academic development.
- Community Service Project is meant to link the community with the college for mutual benefit. The community will be benefited with the focused contribution of the college students for the village/ local development. The college finds an opportunity to develop social sensibility and responsibility among students and also emerge as a socially responsible institution.

**Objective**

Community Service Project should be an integral part of the curriculum, as an alternative to the 2 months of Summer Internships / Apprenticeships / On the Job Training, whenever there is an exigency when students cannot pursue their summer internships. The specific objectives are;

- To sensitize the students to the living conditions of the people who are around them,
- To help students to realize the stark realities of the society.
- To bring about an attitudinal change in the students and help them to develop societal consciousness, sensibility, responsibility and accountability
- To make students aware of their inner strength and help them to find new /out of box solutions to the social problems.
- To make students socially responsible citizens who are sensitive to the needs of the disadvantaged sections.
- To help students to initiate developmental activities in the community in coordination with public and government authorities.
- To develop a holistic life perspective among the students by making them study culture, traditions, habits, lifestyles, resource utilization, wastages and its management, social problems, public administration system and the roles and responsibilities of different persons across different social systems.

**Implementation of Community Service Project**

- Every student should put in a 6 weeks for the Community Service Project during the summer vacation.
- Each class/section should be assigned with a mentor.
- Specific Departments could concentrate on their major areas of concern. For example, Dept. of Computer Science can take up activities related to Computer Literacy to different sections of people like - youth, women, house-wives, etc
- A log book has to be maintained by each of the student, where the activities undertaken/involved to be recorded.
- The logbook has to be countersigned by the concerned mentor/faculty incharge.



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

- Evaluation to be done based on the active participation of the student and grade could be awarded by the mentor/faculty member.
- The final evaluation to be reflected in the grade memo of the student.
- The Community Service Project should be different from the regular programmes of NSS/NCC/Green Corps/Red Ribbon Club, etc.
- Minor project report should be submitted by each student. An internal Viva shall also be conducted by a committee constituted by the principal of the college.
- Award of marks shall be made as per the guidelines of Internship/apprentice/ on the job training

**Procedure**

- A group of students or even a single student could be assigned for a particular habitation or village or municipal ward, as far as possible, in the near vicinity of their place of stay, so as to enable them to commute from their residence and return back by evening or so.
- The Community Service Project is a twofold one –
  - First, the student/s could conduct a survey of the habitation, if necessary, in terms of their own domain or subject area. Or it can even be a general survey, incorporating all the different areas. A common survey format could be designed. This should not be viewed as a duplication of work by the Village or Ward volunteers, rather, it could be another primary source of data.
  - Secondly, the student/s could take up a social activity, concerning their domain or subject area. The different areas, could be like –
    - Agriculture
    - Health
    - Marketing and Cooperation
    - Animal Husbandry
    - Horticulture
    - Fisheries
    - Sericulture
    - Revenue and Survey
    - Natural Disaster Management
    - Irrigation
    - Law & Order
    - Excise and Prohibition
    - Mines and Geology
    - Energy
    - Internet
    - Free Electricity
    - Drinking Water

**EXPECTED OUTCOMES**



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
(Established by Govt. of A.P., ACT No.30 of 2008)  
ANANTHAPURAMU – 515 002 (A.P) INDIA

**CIVIL ENGINEERING**

**BENEFITS OF COMMUNITY SERVICE PROJECT TO STUDENTS**

**Learning Outcomes**

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development
- Improved ability to understand complexity and ambiguity

**Personal Outcomes**

- Greater sense of personal efficacy, personal identity, spiritual growth, and moral development
- Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills

**Social Outcomes**

- Reduced stereotypes and greater inter-cultural understanding
- Improved social responsibility and citizenship skills
- Greater involvement in community service after graduation

**Career Development**

- Connections with professionals and community members for learning and career opportunities
- Greater academic learning, leadership skills, and personal efficacy can lead to greater opportunity

**Relationship with the Institution**

- Stronger relationships with faculty
- Greater satisfaction with college
- Improved graduation rates

**BENEFITS OF COMMUNITY SERVICE PROJECT TO FACULTY MEMBERS**

- Satisfaction with the quality of student learning
- New avenues for research and publication via new relationships between faculty and community
- Providing networking opportunities with engaged faculty in other disciplines or institutions
- A stronger commitment to one's research

**BENEFITS OF COMMUNITY SERVICE PROJECT TO COLLEGES AND UNIVERSITIES**

- Improved institutional commitment
- Improved student retention
- Enhanced community relations

**BENEFITS OF COMMUNITY SERVICE PROJECT TO COMMUNITY**

- Satisfaction with student participation
- Valuable human resources needed to achieve community goals
- New energy, enthusiasm and perspectives applied to community work
- Enhanced community-university relations.



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
(Established by Govt. of A.P., ACT No.30 of 2008)  
ANANTHAPURAMU – 515 002 (A.P) INDIA

**CIVIL ENGINEERING**

**SUGGESTIVE LIST OF PROGRAMMES UNDER COMMUNITY SERVICE PROJECT**

The following the recommended list of projects for Engineering students. The lists are not exhaustive and open for additions, deletions and modifications. Colleges are expected to focus on specific local issues for this kind of projects. The students are expected to carry out these projects with involvement, commitment, responsibility and accountability. The mentors of a group of students should take the responsibility of motivating, facilitating, and guiding the students. They have to interact with local leadership and people and appraise the objectives and benefits of this kind of projects. The project reports shall be placed in the college website for reference. Systematic, Factual, methodical and honest reporting shall be ensured.

**For Engineering Students**

1. Water facilities and drinking water availability
2. Health and hygiene
3. Stress levels and coping mechanisms
4. Health intervention programmes
5. Horticulture
6. Herbal plants
7. Botanical survey
8. Zoological survey
9. Marine products
10. Aqua culture
11. Inland fisheries
12. Animals and species
13. Nutrition
14. Traditional health care methods
15. Food habits
16. Air pollution
17. Water pollution
18. Plantation
19. Soil protection
20. Renewable energy
21. Plant diseases
22. Yoga awareness and practice
23. Health care awareness programmes and their impact
24. Use of chemicals on fruits and vegetables
25. Organic farming
26. Crop rotation
27. Floury culture
28. Access to safe drinking water
29. Geographical survey
30. Geological survey
31. Sericulture



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
(Established by Govt. of A.P., ACT No.30 of 2008)  
ANANTHAPURAMU – 515 002 (A.P) INDIA

**CIVIL ENGINEERING**

32. Study of species
33. Food adulteration
34. Incidence of Diabetes and other chronic diseases
35. Human genetics
36. Blood groups and blood levels
37. Internet Usage in Villages
38. Android Phone usage by different people
39. Utilisation of free electricity to farmers and related issues
40. Gender ration in schooling level- observation.

Complimenting the community service project the students may be involved to take up some awareness campaigns on social issues/special groups. The suggested list of programmes are;

**Programmes for School Children**

1. Reading Skill Programme (Reading Competition)
2. Preparation of Study Materials for the next class.
3. Personality / Leadership Development
4. Career Guidance for X class students
5. Screening Documentary and other educational films
6. Awareness Programme on Good Touch and Bad Touch (Sexual abuse)
7. Awareness Programme on Socially relevant themes.

**Programmes for Women Empowerment**

1. Government Guidelines and Policy Guidelines
2. Womens' Rights
3. Domestic Violence
4. Prevention and Control of Cancer
5. Promotion of Social Entrepreneurship

**General Camps**

1. General Medical camps
2. Eye Camps
3. Dental Camps
4. Importance of protected drinking water
5. ODF awareness camp
6. Swatch Bharath
7. AIDS awareness camp
8. Anti Plastic Awareness
9. Programmes on Environment
10. Health and Hygiene
11. Hand wash programmes
12. Commemoration and Celebration of important days

**Programmes for Youth Empowerment**

1. Leadership
2. Anti-alcoholism and Drug addiction



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

3. Anti-tobacco
4. Awareness on Competitive Examinations
5. Personality Development

**Common Programmes**

1. Awareness on RTI
2. Health intervention programmes
3. Yoga
4. Tree plantation
5. Programmes in consonance with the Govt. Departments like –
  - i. Agriculture
  - ii. Health
  - iii. Marketing and Cooperation
  - iv. Animal Husbandry
  - v. Horticulture
  - vi. Fisheries
  - vii. Sericulture
  - viii. Revenue and Survey
  - ix. Natural Disaster Management
  - x. Irrigation
  - xi. Law & Order
  - xii. Excise and Prohibition
  - xiii. Mines and Geology
  - xiv. Energy

**Role of Students:**

- Students may not have the expertise to conduct all the programmes on their own. The students then can play a facilitator role.
- For conducting special camps like Health related, they will be coordinating with the Governmental agencies.
- As and when required the College faculty themselves act as Resource Persons.
- Students can work in close association with Non-Governmental Organizations like Lions Club, Rotary Club, etc or with any NGO actively working in that habitation.
- And also with the Governmental Departments. If the programme is rolled out, the District Administration could be roped in for the successful deployment of the programme.
- An in-house training and induction programme could be arranged for the faculty and participating students, to expose them to the methodology of Service Learning.

**Timeline for the Community Service Project Activity**

**Duration: 8 weeks**

**1. Preliminary Survey (One Week)**

- A preliminary survey including the socio-economic conditions of the allotted habitation to be conducted.



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
**(Established by Govt. of A.P., ACT No.30 of 2008)**  
**ANANTHAPURAMU – 515 002 (A.P) INDIA**

**CIVIL ENGINEERING**

- A survey form based on the type of habitation to be prepared before visiting the habitation with the help of social sciences faculty. (However, a template could be designed for different habitations, rural/urban.
- The Governmental agencies, like revenue administration, corporation and municipal authorities and village secretariats could be aligned for the survey.

**2. Community Awareness Campaigns (One Week)**

- Based on the survey and the specific requirements of the habitation, different awareness campaigns and programmes to be conducted, spread over two weeks of time. The list of activities suggested could be taken into consideration.

**3. Community Immersion Programme (Three Weeks)**

**Along with the Community Awareness Programmes**, the student batch can also work with any one of the below listed governmental agencies and work in tandem with them. This community involvement programme will involve the students in exposing themselves to the experiential learning about the community and its dynamics. Programmes could be in consonance with the Govt. Departments.

**4. Community Exit Report (One Week)**

- During the last week of the Community Service Project, a detailed report of the outcome of the 8 weeks work to be drafted and a copy shall be submitted to the local administration. This report will be a basis for the next batch of students visiting that particular habitation. The same report submitted to the teacher-mentor will be evaluated by the mentor and suitable marks are awarded for onward submission to the University.

Throughout the Community Service Project, a daily log-book need to be maintained by the students batch, which should be countersigned by the governmental agency representative and the teacher-mentor, who is required to periodically visit the students and guide them.