B.S. Abdur Rahman

Crescent

Institute of Science & Technology

Deemed to be University u/s 3 of the UGC Act, 1956

ANNEXURE 2.6.2

S. No.	Details	Page No.
1.	Report on Attainment of Programme Outcome and Course Outcome • Course Name: CEC4106 - GIS and its applications Academic year: 2021-22	2

ATTAINMENT OF PROGRAM OUTCOME (PO) AND COURSE OUTCOME (CO)

Department of Civil Engineering, School of Infrastructure of B S Abdur Rahman Crescent Institute of Science and Technology has been following the outcome based education since 2013. Outcome Based Education (OBE) which is a student-centric teaching and learning methodology is considered from course delivery to   assessments to achieve stated objectives and outcomes.

Through the OBE model the progress of the graduate is measured through the following four parameters namely

- Program Educational Objectives (PEO)
- Program Outcomes (PO)
- Program Specific Outcomes (PSO)
- Course Outcomes (CO)

Attainment of Program Outcome (PO)

The attainment of PO is achieved in two ways.
- **Direct attainment**
- **Indirect attainment**

DIRECT ATTAINMENT

Direct attainment level of a PO / PSO is determined by taking average across all courses addressing that PO / PSO based on students performnance.

The various direct and indirect assessment tools and processes used for measuring the attainment of each POs and PSOs are furnished below.

DIRECT ASSESSMENT TOOLS

- ❖ Assignments
- ❖ Continuous assessment test
- ❖ End semester examination
- ❖ Seminar
- ❖ Performance in lab courses
- ❖ Project
- ❖ Internship
- ❖ Students feedback on course
- ❖ Teachers feedback on courses

Processes used for the attainments of POs are:

- Assignment questions or case studies are provided to students to expand their analytical and design skills and accordingly their performance will be evaluated. This is done as part of every course of every semester and attainment of PO is measured.

- To gain knowledge on current scenario, students are advised to prepare and present the topics related to the advancements in the construction industry.

- Teacher's feedback and student's feedback will help to modify / develop the course contents.

- Knowledge obtained by the students will be assessed through continuous assessment exams and End semester exams.

- Research projects will be taken in the form of design and mini project and will be evaluated through internal reviews and viva-voce which will be assessed by external examiner.

- Participation in project competitions, presenting the research project in international and national conference.

INDIRECT ATTAINMENT

Indirect attainment level of a PO/PSO is determined based on the

- Alumni survey
- Parent's survey
- Employer survey
- Students exit survey

Alumni and Exit survey are collected from the students. The Parents survey and Employer survey are collected from parents and employers. The survey consists of scores on a scale of 1 to 5, with 1 – Fair, 2 - Satisfactory, 3 – Good, 4 – Very good, 5 - Excellent for the programme. The results from the surveys show that attainment of POs and PSOs are good since most of the ratings were between 3 to 5.

In the overall attainment, 60% weightage is given to direct assessment while 40% weightage is assigned to indirect assessment and this helps for the continuous quality improvement process. The attainment levels of POs & PSOs are categorized as:

- Average - < 50%
- Moderate - 51 to 80%
- Excellent - > 80%

Flow Chart for the process of Attainment of Program Outcome (PO)
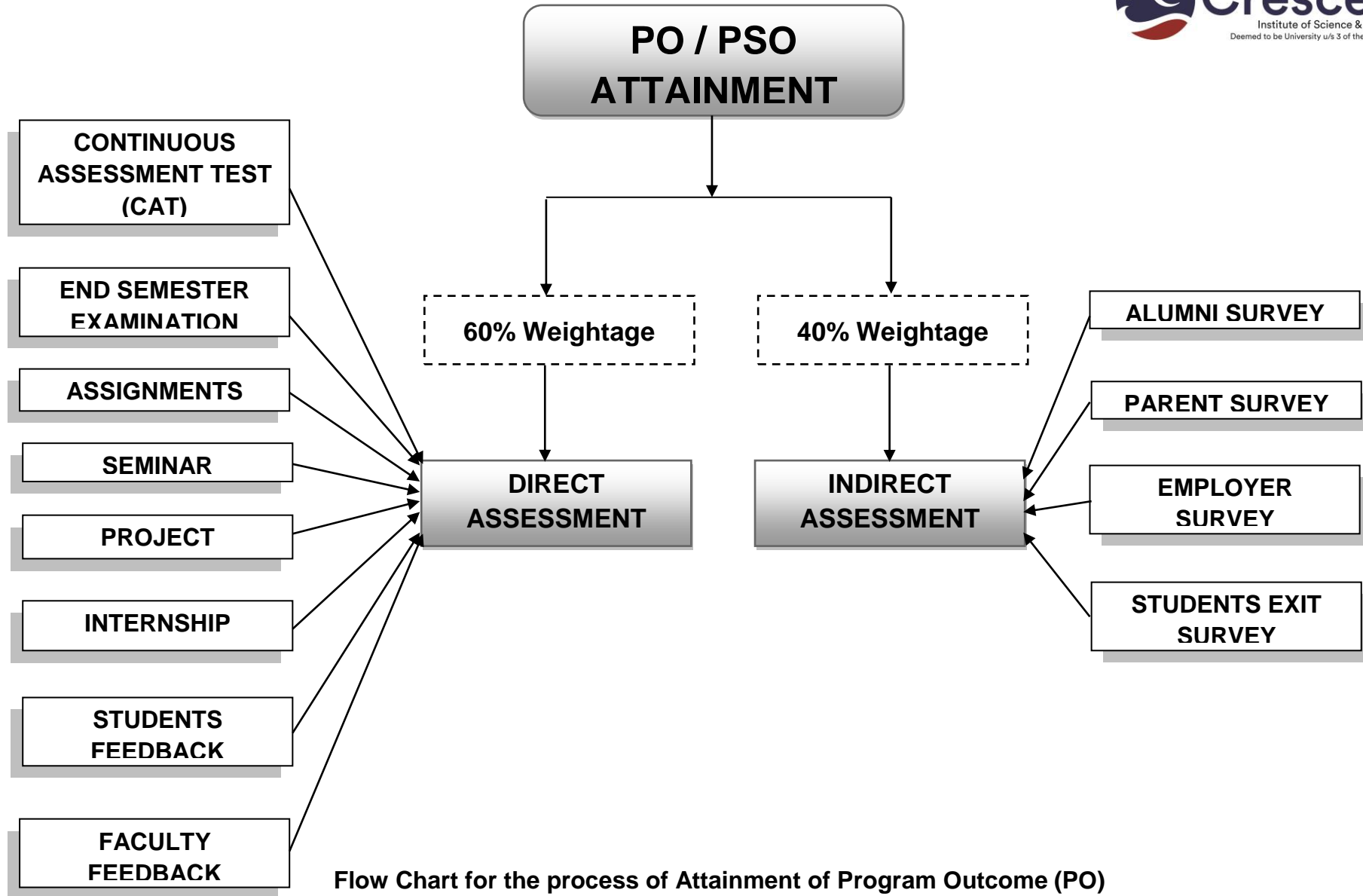
IONCUDOS OBE SOFTWARE

- An IonCUDOS - OBE software is used for the measurement of course outcomes and programme outcomes attainment. This involves framing cohesive Program Educational Objectives (PEOs), Program Outcomes (POs), Course Outcomes (COs) and ensuring assessment and attainment of these outcomes.

- The IonCUDOS software calculates and depicts the attainment of various COs in percentage for each course and also it provides the POs & PSOs attainment of the programme based on the entry of input data.

- IonCUDOS OBE platform helps institutionalizing OBE practices, achieving transparency, optimizing data inputs, standardizing computation of attainments, isolating areas for improvements, trends from large historical data from batches, and generating Self-Assessment Report (SAR) in a timely manner.

B.S.ABDUR RAHMAN CRESCENT INSTITUTE OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFRASTRUCTURE

DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN

1. **Course Title** : **GIS and its Applications**   5. **Semester** : **VII**

2. **Course Code** : **CEC4106**   6. **Academic Year : 2021-2022**

3. **Course Faculty : K.Kanmani**   7. **Department** : **Civil**

4. **Theory / Practical: Theory with Integrated Laboratory**   8. **No. of Credits : 3**

9. **Course Learning Objectives:**

The objectives of this course are to enable the students

• To provide information to segregate real world data, different storage procedures and database structures to store the GIS data in a database management system.

• To impart knowledge on classification of real world data into raster and vector representation, to understand data quality and handling of errors.

10. **Course pre-requisites: Nil**

11. **Schedule of teaching and learning**

Sl.No.	Period	Topic	Mode of Delivery	Teaching Aids	Reference / Source

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Annexure - 1

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12. **Course material and References**

• A1 - Anji Reddy, "Remote sensing and Geographical systems", B.S Publications, Hyderabad, 2008.

• **A2 -** Burrough, P.A., "Principles of Geographical Information Systems", Oxford Publication, 2001.

- **A3 -** Chor Pang Lo and Albert K.W. Yeung, "Concepts and Techniques of Geographic Information Systems", Pearson Educations Inc., 2019.
- **A4 -** De Mers and Michael, N., "Fundamentals of geographic information system", 2nd Edition, John Wiley and sons, 2003.
- **A5 -** https://www.gislounge.com/gis-essentials
- **A6 -** https://www.esri.com/training/catalog/5b73407f8659c25ea7014330/gis-fundamentals

13. Assessment Scheme:

For Theory (Online mode)

Assessment No.	Allotted Weightage		Total Marks	Weightage of marks
CAT I **Online Mode**	Assignment **(40%)**	Test mark **(60%)**	100	37.5%
CAT II **Online Mode**	Assignment **(40%)**	Test mark **(60%)**	100	
End-Sem. Exam	_____	Test mark (100%)	100	37.5%
			Total weightage for Theory	**75%**

For Theory (Offline mode)

Assessment No.	Allotted Weightage		Total Marks	Weightage of marks
CAT I **Offline Mode**	Assignment **(20%)**	Test mark **(80%)**	100	37.5%
CAT II **Offline Mode**	Assignment **(20%)**	Test mark **(80%)**	100	
End-Sem. Exam	_____	Test mark (100%)	100	37.5%
			Total weightage for Theory	**75%**

Assignment No.	Allotted Weightage	
CAT I Assignment Online Mode	Assignment - Preparation of Covid -19 Mapping nearby their location **(20 Marks)**	Multi Choice Questions **(20 Marks)**
CAT II Assignment	Assignment - Individual Presentation	Multi Choice Questions

Online Mode	on Applications of GIS in Civil Engineering **(20 Marks)**	**(20 Marks)**
CAT I Assignment Offline Mode	Assignment - Preparation of Covid -19 Mapping nearby their location **(20 Marks)**	
CAT II Assignment Offline Mode	Assignment - Individual Presentation on Applications of GIS in Civil Engineering **(20 Marks)**	

For Laboratory

The student will be assessed every class for the performance in the lab and the Weightage for the continuous assessment will be 15% and the Weightage for end semester examination will be 10%.

Type of Assessment	Total Marks	Weightage of Marks
Continuous Assessment (Internal)	60	15%
End-Sem. Exam (external)	100	10%
Total weightage for laboratory		**25%**

i) Periodical tests

Assessment No.	Duration	Topics	Marks
CAT I	1:30 hrs	Module I & II	50
CAT II	1:30 hrs	Module III & IV	50
End-Sem. Exam	2:30 hrs	Modules I - IV	100

ii) Term paper / Assignment

Individual Oriented Term Paper and Individual Assignments

iii) Seminar

Seminar on individual topics to students.

iv) Quiz / Comprehension   NA

v) Fabrication / assembling NA

vi) Case study discussion   NA

vii) Carry home exercise

Two carry home exercises would be given before the assessment tests and the exercises have to be submitted on the same day of the Assessment Test. Each exercise will carry 20 marks.

viii) Self-study   NA

ix) Content beyond syllabus NPTEL, MIT Opencourseware

14. Course outcomes

On completion of the course, the student will be able to

- List the different components of GIS and to identify different elements of a map.

- Create raster, vector layers and to generate and create error free spatial data with its attributes.

- Generate spatial queries and analysis and to identify the outputs achieved.

- Solve real world problems on business development, electric utilities and mobile GIS through spatial analysis.
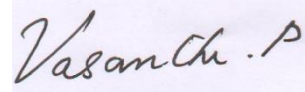
15. Mapping of course outcomes with learning activities and assessments

Course outcomes	Learning activities	Assessments	CAT I * %	CAT II * %	End sem * %
Course outcome 1	Learning through lectures and PPT	Based on home assignment and test performance	50	-	25
Course outcome 2	Learning through lectures and PPT	Based on home assignment and test performance	50	-	25
Course outcome 3	Learning through lectures and PPT	Based on home assignment and test performance	-	50	25
Course outcome 4	Learning through lectures and PPT	Based on home assignment and test performance	-	50	25

*% of marks in the question paper relevant to the respective outcomes

Course faculty   **DEAN (SOI)**

ANNEXURE - 1
Schedule of Teaching and Learning
Theory

Sl. No.	Period	Topic	Mode of delivery	Teaching Aids	Reference / Source
Module I – Fundamentals of GIS					
1	1	Introduction of GIS – Definition and technical terms	Online Lecture	Video Conferencing	**A1, A2, A5, A6**
2	1	Components of GIS – hardware, software, data, people & method	Online Lecture	Video Conferencing	
3	1	Geographic data presentation – maps, classification of maps and its uses	Online Lecture	Video Conferencing	
4	1	Coordinate system – Geographic and Projected coordinate system	Online Lecture	Video Conferencing	
5	1	Maps projections and transformations	Online Lecture	Video Conferencing	
6	1	Types of map projections and its applications	Online Lecture	Video Conferencing	
7	1	Georeferencing – mapping process with workflow	Online Lecture	Video Conferencing	
Module II – GIS Data Models & Data Quality					
8	1	Geographic data representation – raster & vector, Topology and its significance	Online Lecture	Video Conferencing	**A2, A3, A4, A6**
9	1	Raster data models – field based and object based raster models, cell by cell encoding, Run length encoding & Quad tree encoding	Online Lecture	Video Conferencing	
10	1	Vector data models – field based and object based vector models, Topological and non-topological structures	Online Lecture	Video Conferencing	
11	1	Database management – hierarchical, relational and network models	Online Lecture	Video Conferencing	
12	1	Data quality – introduction and concepts	Online Lecture	Video Conferencing	

13	1	Components of data quality – Micro level, Macro level and usage components	Online Lecture	Video Conferencing	
14	1	Assessment of data quality – estimation using least squares method, Data Quality Standard – Spatial Data Transfer Standard (SDTS)	Online Lecture	Video Conferencing	
15	1	Sources of GIS data errors and managing of data errors	Online Lecture	Video Conferencing	
Module III – Spatial Analysis					
16	1	GIS data processing – Data capture and Data sources	Online Lecture	Video Conferencing	
17	1	Queries – Vector data query and raster data query	Online Lecture	Video Conferencing	
18	1	Integration of spatial and non–spatial data, Slope, Aspect and Statistical Analysis	Online Lecture	Video Conferencing	
19	1	Overlay operations and tools used for spatial analysis, Buffering	Online Lecture	Video Conferencing	**A4, A5, A6**
20	1	Overlay analysis – vector and raster analysis	Online Lecture	Video Conferencing	
21	1	Network analysis – Network Tracing, Routing and allocation	Online Lecture	Video Conferencing	
22	1	Surface analysis – hillshade, viewshed and watershed analysis	Online Lecture	Video Conferencing	
23	1	Digital Terrrain Modelling (DTM), comparison with DEM	Online Lecture	Video Conferencing	
Module IV – Applications of GIS In Civil Engineering					
23	1	Applications of GIS – List of applications in various sectors	Online Lecture	Video Conferencing	**A3, A4, A5, A6**
24	1	Natural resources management – Landuse & Landcover mapping	Online Lecture	Video Conferencing	
25	1	Natural hazard management – hazard and risk assessment analysis	Online Lecture	Video Conferencing	

SI. No.	Period	Topic	Mode of delivery	Teaching Aids	Reference / Source
26	1	Vehicle Tracking using GIS & GPS	Online Lecture	Video Conferencing	
27	1	Water resources management-watershed management	Online Lecture	Video Conferencing	
28	1	Surveying and mapping using Unmanned Aerial Vehicle (UAV)	Online Lecture	Video Conferencing	
29	1	Environmental Engineering – solid waste management & air quality monitoring	Online Lecture	Video Conferencing	
30	1	Web GIS & Mobile GIS – introduction and applications	Online Lecture	Video Conferencing	

Total Theory Hours – 30

Laboratory

Schedule of Teaching and Learning

SI. No.	Period	Topic	Mode of delivery	Teaching Aids	Reference / Source
1	1	**INTRODUCTION TO QGIS**	Online Demo	Video Conferencing	
2	2	**GEOREFERENCING AND RECTIFYING AN IMAGE**	Online Demo	Video Conferencing	
3	2	**CREATION OF SHAPEFILE AND ONSCREEN DIGITIZATION**	Online Demo	Video Conferencing	
4	2	**ADDING ATTRIBUTES AND LINKING EXTERNAL TABLE** Adding attributes, using joins and relates - Data Cleanup Tools.	Online Demo	Video Conferencing	**A1, A2, A3, A4, A5**
5	1	**GIS QUERYING**	Online Demo	Video Conferencing	
6	1	**DATA CONVERSION** Convert data from one format to other format. 1. Raster to Vector and 2. Vector to Raster	Online Demo	Video Conferencing	
7	2	**GENERATION OF CONTOURS FROM DIGITAL ELEVATION MODEL (DEM)**	Online Demo	Video Conferencing	

8	2	**SHORTEST PATH ANALYSIS IN QGIS** Road network - Shortest path analysis	Online Demo	Video Conferencing	
9	2	**CONVERTING DATA INTO KML FILE AND OVERLAYING IN GOOGLE EARTH**	Online Demo	Video Conferencing	

Total Laboratory Hours – 15

Total Hours – 45 (Theory – 30 + Laboratory – 15)

Course faculty

DEAN (SOI)

DIRECT ATTAINMENT

Course Articulation Matrix – Mapping between CO & PO

CEC4106 GIS and its applications (Semester VII)

Course outcome	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CEC 4106.1	List the different components of gis and to identify different elements of a map.	3	3	3	2	3	2	2	-	1	1	2	1	-	2	-
CEC 4106.2	Create raster, vector layers and to generate and create error free spatial data with its attributes.	3	3	3	2	3	2	2	-	1	1	2	1	-	2	-
CEC 4106.3	Generate spatial queries and analysis and to identify the outputs achieved.	3	3	3	2	3	2	2	-	1	1	2	1	-	2	-
CEC 4106.4	Solve real world problems on business development, electric utilities and mobile gis through spatial analysis.	3	3	2	2	3	3	3	-	1	1	2	1	-	2	-

The correlations are indicated by levels 1, 2 & 3.

- 1 represents Slight (Low) correlation between the course outcome and the program outcome.

- 2 represents Moderate (Medium) correlation between the course outcome and the program outcome

- 3 represents Substantial (High) correlation between the course outcome and the program outcome and

- - represents no correlation between the course outcome and the program outcome.

Program Articulation Matrix – Mapping between CO & PO

CEC4106 GIS and its applications (Semester VII)

Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CEC4106 GIS and its applications	3	3	3	2	3	-	2	-	1	1	2	1	-	2	-

The correlations are indicated by levels 1, 2 & 3.

- 1 represents Slight (Low) correlation between the course outcome and the program outcome.

- 2 represents Moderate (Medium) correlation between the course outcome and the program outcome

- 3 represents Substantial (High) correlation between the course outcome and the program outcome and

- - represents no correlation between the course outcome and the program outcome.

Processes of Continuous Assessment Tests (CAT) and assignment for attainment of CO

The process is neatly illustrated with the core course CEC4106 GIS and its applicationsContinuous Assessment Tests (CAT) question paper and assignment. The step by step procedure is explained as follows:

- Questions of the Continuous Assessment Test (CAT) are mapped to various course outcomes and their contribution was calculated.
- The percentage of each CO attained by a student is calculated by dividing the marks obtained by the student to the marks allotted for each CO.
- The same procedure is carried out for all the students.
- The average of the attainment of the individual student CO's will give each CO attainment for the entire course.
- The average attainment level of the entire class for each CO is computed and compared to the % threshold set up.
- The whole process is done with the help of IONCUDOS software.

This process is explained with the course CEC4106 GIS and its applications (CAT Question paper - course outcomes are suitably mapped to the different questions under different sections) - as an example.

CEC4106 GIS and its applications– Weightage of Assignment Marks

Sl. No.	Assessment Occasion (AO) Name	Assessment Occasion (AO) Method	Assessment Type	Maximum Marks
1.	CAT 1	Internal Assessment	Question paper	50.00
2.	CAT 2	Internal Assessment	Question paper	50.00
3.	CAT 1 Assignment	Assignment	Individual	50.00
4.	CAT 2 Assignment	Assignment	Individual	50.00

<CEC4106>

RRN											

Programme & Branch	:	**B. Tech., CIVIL ENGINEERING**		
Semester	:	**VII**	Date & Session :	**20/10/2021**
Course Code & Name	:	**CEC4106 GIS and its applications**		
Duration	:	**90 minutes**	Maximum Marks :	**50**

CONTINUOUS ASSESSMENT TEST 1 – OCTOBER 2021
ANSWER ALL QUESTIONS

			Course Outcome
	PART A (5 X 2 = 10 MARKS)		
1.	Differentiate between topographical maps and chorographical maps.		**1**
2.	How does GIS differ from other related information system?		**1**
3.	List the types of spatial data.		**1**
4.	Write the limitations of Spaghetti data model.		**2**
5.	State the importance of using topology in GIS data.		**2**

PART B (2 X 12 = 24 MARKS)

6.a	(i)	As a GIS analyst, you have been provided some multidimensional data with total rainfall values over Western Ghats region for a time span of 5 years. The data has been collected every week for all five years. When considering the study of research, the desired time period is in months. Now how will you integrate the rainfall data with the spatial data? Explain in detail.	**(10)**	**1**
	(ii)	Illustrate the various components of GIS with a neat workflow.	**(10)**	**1**
		(OR)		

b	(i)	Explain the classification of map projections based on the following criteria
		    a) Position of light source
		    b) Type of development surface used
			(10)	**1**

	(ii)	You are given a high resolution Quickbird satellite image as	**(10)**	**1**

raster image and also the four ground control point coordinates. What are the steps involved to perform georeferencing this satellite image? Explain in detail with a neat illustration.

7.a	(i)	Give a detailed account on the various types of raster data models that are used to store the data efficiently.	**(10)**	**2**
	(ii)	Explain in detail about the types of geospatial standards, objectives & levels of standardization in geospatial data and organizations involved in setting up geospatial data standards.	**(10)**	**2**

(OR)

b	(i)	A new proposal is signed to select a solid waste dump area in the outskirts of Chennai city. Identify what type of vector data entity can be prepared for this proposal. How will you store those vector data in the model and explain them with examples.	**(10)**	**2**
	(ii)	Elaborate on various components of data quality.	**(10)**	**2**

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**Name & Signature
of Course faculty**
(K. KANMANI)

**Name & Signature
of DAAC Member**
(Dr. P. VASANTHI)

CEC4106 GIS and its applications- Course Outcome Marks Distribution

Course Outcome	Marks Distribution (X)	% Distribution
CO1	48.00	53.33 %
CO2	42.00	46.67 %
Total	**90.00 (Y)**	**100.00 %**
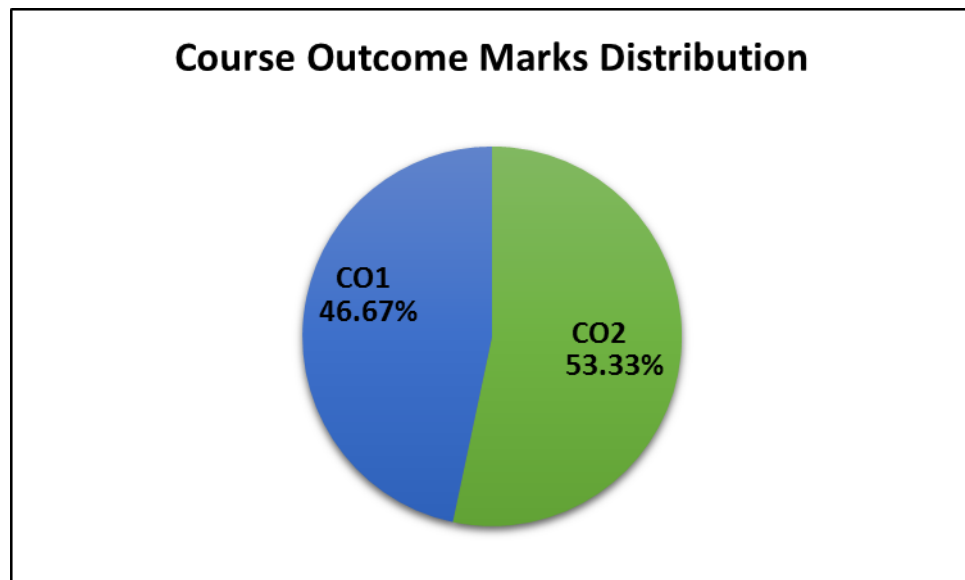
CEC4106 GIS and its applications- Course Outcome Marks Distribution

CEC4106 GIS and its applications- CIA Marks Entry in IONCUDOS

student_us	student_name	1(2.00)	2(2.00)	3(2.00)	4(2.00)	5(2.00)	6a(12.00)	6b(8.00)	6c(12.00)	6d(8.00)
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170011601002	AADHIL. K	2	2	2	2		11	7		
170011601003	AAKASH RAJ THILAK N									
170011601004	ABDUL KALAM M	2	2	2	2		11	7		
170011601005	ABDUR RAHMAN QURESHI	2	2	2	2		11	7		
170011601006	ABISHAKE R	1	2	2	2		11	7		
170011601007	ABYAZ AIMAN A	1	2	2	2		11	7		
170011601008	AHAMED ASHFAR J	1	2	2	2		11	7		
170011601009	AHMAD AL MUBEEN K N	2	2	2	2		11	7		
170011601010	AJAY M	2	2	2	2	1	12	7		
170011601011	AMARNATH S	2	2	2	2		11	7		
170011601012	APSARKHAN P.	2	2	2	2		10	7		
170011601013	ARAFAT WAHITHA N	2	2	2	2	2	11	7		
170011601014	DEEKSHANA G	2	2	2	2		11	7		
170011601015	DHARMA R B	2	2	2	2	1	12	7		
170011601016	ESSAM MOHAMED S		2	2	2		11	7		
170011601017	FAYAAZ RIZWAN.M		2	2	2		11	7		
170011601018	FAYAZ AHAMED.I	2	2	2	2		11	7		
170011601019	HRITHICK RAHUL G		2	2	2		11	7		
170011601020	IBRAHIM ADUHAM S N	2	2	2	2	2	11	7		
170011601022	JONNALA THARUN REDDY	2	2	2	2		10	7		
170011601023	KAARTHIKEYAN G M	1	2	2	2		11	6		
170011601024	KANNAN. K	2	2	2	2		11	7		
170011601025	KARTHEKEYAN M A P	2	2	2	2		11	7		

student_us	student_name	7a(16.00)	7b(4.00)	7c(12.00)	7d(8.00)	grand_total_n
170011601001	A. AATHIL RASOOL			10	6	41
170011601002	AADHIL. K			10	6	42
170011601003	AAKASH RAJ THILAK N				Ab	
170011601004	ABDUL KALAM M			10	6	42
170011601005	ABDUR RAHMAN QURESHI			10	6	42
170011601006	ABISHAKE R			10	6	41
170011601007	ABYAZ AIMAN A			11	7	43
170011601008	AHAMED ASHFAR J			10	6	41
170011601009	AHMAD AL MUBEEN K N			10	6	42
170011601010	AJAY M			11	8	47
170011601011	AMARNATH S			10	6	42
170011601012	APSARKHAN P.			8	5	38
170011601013	ARAFAT WAHITHA N			11	7	46
170011601014	DEEKSHANA G			11	7	44
170011601015	DHARMA R B			11	8	47
170011601016	ESSAM MOHAMED S			11	7	42
170011601017	FAYAAZ RIZWAN.M			11	7	42
170011601018	FAYAZ AHAMED.I			11	7	44
170011601019	HRITHICK RAHUL G			11	7	42
170011601020	IBRAHIM ADUHAM S N			11	7	46
170011601022	JONNALA THARUN REDDY			11	6	42
170011601023	KAARTHIKEYAN G M			11	7	42
170011601024	KANNAN. K			10	6	42
170011601025	KARTHEKEYAN M A P			10	6	42

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170011601027	KISHORE V	1	2	2	2		11	6		
170011601028	KOMESHWARAN.P	1	2	2	2		11	6		
170011601030	MOHAMED ARSATH S.A.	1	2	2	2		11	6		
170011601031	MOHAMED AZARUDEEN.M	1	2	2	2		10	6		
170011601032	MOHAMED FAHAD H	2	2	2	2		11	6		
170011601033	MOHAMED FAIZAL M	2	2	2	2		10	6		
170011601034	MOHAMED HAROON RAZEED A	2	2	2	2		10	6		
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170011601039	SHAIK MOHAMMED HANIEF	2	2	2	2		11	6		
170011601077	ABDULLAH	2	2	2	2		10	6		
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170011602002	D. DAVID VASANTHA RAJ	2	2	2			11	7		
170011602003	S. JAYESH	2	2	2	2		11	6		
170011602004	M. ABDUL KAFUR	2	2	2	2		11	6		
170011602005	A. MOHAMED FAISAL	2	2	2	2		11	7		
170011603001	S. RISHI	2	2	2	2		11	7		

student_usn	student_name	7a(16.00)	7b(4.00)	7c(12.00)	7d(8.00)	grand_total_n
170011601027	KISHORE V			11	7	42
170011601028	KOMESHWARAN.P			11	7	42
170011601030	MOHAMED ARSATH S.A.			11	7	42
170011601031	MOHAMED AZARUDEEN.M			10	7	40
170011601032	MOHAMED FAHAD H			11	7	43
170011601033	MOHAMED FAIZAL M			10	7	41
170011601034	MOHAMED HAROON RAZEED A			10	7	41
170011601035	MOHAMED IBRAHIM.A			10	6	40
170011601036	MOHAMEDFAZIL A			10	7	41
170011601037	MOHAMMAD FIROZ BASHA G			11	7	42
170011601038	MOHAMMED ASHIQ S			10	7	41
170011601039	SHAIK MOHAMMED HANIEF			11	7	43
170011601077	ABDULLAH			11	7	42
170011602001	M. ABDUL JAMEEL			11	7	43
170011602002	D. DAVID VASANTHA RAJ			11	7	42
170011602003	S. JAYESH			11	7	43
170011602004	M. ABDUL KAFUR			11	7	43
170011602005	A. MOHAMED FAISAL			11	7	44
170011603001	S. RISHI			11	7	44

CEC4106 GIS and its applications– CAT 1 Assignment Marks Entry in IONCUDOS

student_usr	student_name	1a(50.00)
170011601001	A. AATHIL RASOOL	33
170011601002	AADHIL. K	43
170011601003	AAKASH RAJ THILAK N	44
170011601004	ABDUL KALAM M	48
170011601005	ABDUR RAHMAN QURESHI	21
170011601006	ABISHAKE R	47
170011601007	ABYAZ AIMAN A	47
170011601008	AHAMED ASHFAR J	39
170011601009	AHMAD AL MUBEEN K N	43
170011601010	AJAY M	44
170011601011	AMARNATH S	46
170011601012	APSARKHAN P.	44
170011601013	ARAFAT WAHITHA N	46
170011601014	DEEKSHANA G	44
170011601015	DHARMA R B	46
170011601016	ESSAM MOHAMED S	37
170011601017	FAYAAZ RIZWAN.M	40
170011601018	FAYAZ AHAMED.I	41
170011601019	HRITHICK RAHUL G	40
170011601020	IBRAHIM ADUHAM S N	29
170011601022	JONNALA THARUN REDDY	38
170011601023	KAARTHIKEYAN G M	46
170011601024	KANNAN. K	45
170011601025	KARTHEKEYAN M A P	32
170011601027	KISHORE V	41
170011601028	KOMESHWARAN.P	41
170011601030	MOHAMED ARSATH S.A.	39
170011601031	MOHAMED AZARUDEEN.M	33
170011601032	MOHAMED FAHAD H	47
170011601033	MOHAMED FAIZAL M	36
170011601034	MOHAMED HAROON RAZEE	27
170011601035	MOHAMED IBRAHIM.A	40
170011601036	MOHAMEDFAZIL A	40
170011601037	MOHAMMAD FIROZ BASHA	42
170011601038	MOHAMMED ASHIQ S	45
170011601039	SHAIK MOHAMMED HANIEF	35
170011601077	ABDULLAH	39
170011602001	M. ABDUL JAMEEL	47
170011602002	D. DAVID VASANTHA RAJ	36
170011602003	S. JAYESH	43
170011602004	M. ABDUL KAFUR	40
170011602005	A. MOHAMED FAISAL	42
170011603001	S. RISHI	45

- Attainment Threshold is set for Continuous Assessment Tests (CAT) and End Semester examination.

Threshold Attainment for CAT and End Semester examination

Sl. No.	Course Code	Course Name	CIA Attainment Threshold (%)	TEE Attainment Threshold (%)
1.	CEC4106	GIS and its applications	50	50

- The Threshold based Attainment % is calculated using the below formula:
- **Threshold based Attainment % = (x / y) * 100**

    where x = Count of Students >= to Threshold %

        y = Total number of students attempted

- **Average based Attainment % = (x / y) *100**

    where x = Average Secured marks of Attempted Students

        y = Maximum Marks

- Similarly, CAT 2 question paper is mapped with their respective course outcomes and the student's marks is also entered in IONCUDOS.

- Then, the overall class student's performance in CAT with respect to the Threshold % for individual Course Outcomes (COs) is depicted in the graph below.
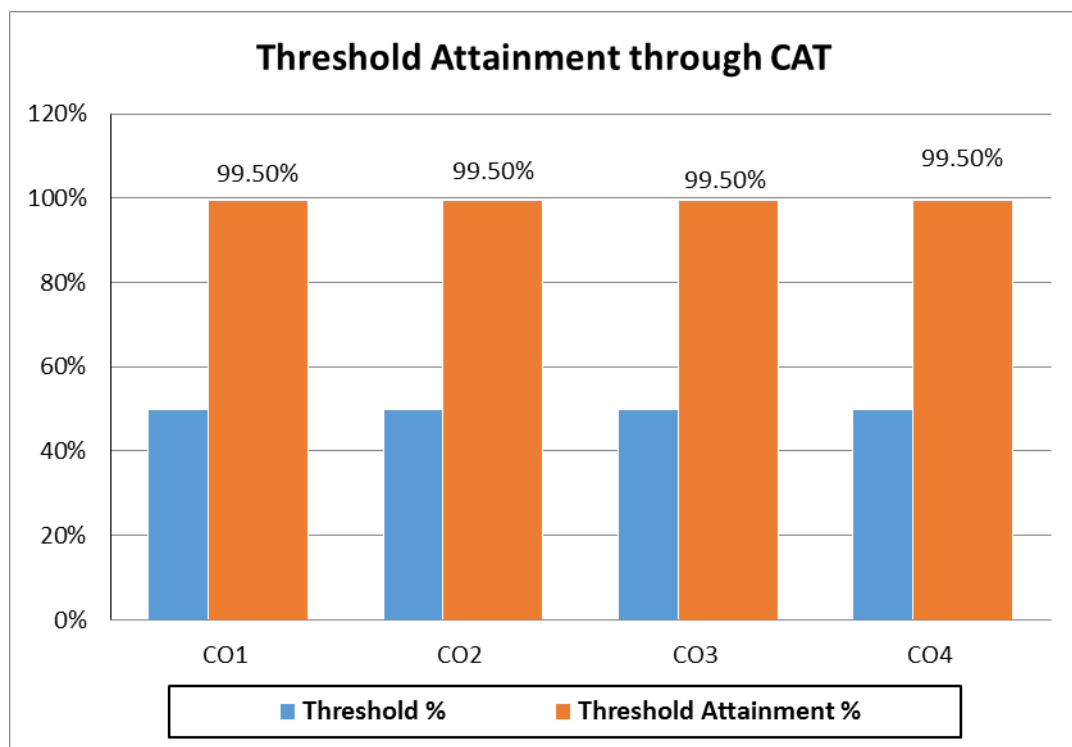
CEC4106 GIS and its applications– Threshold Attainment for CAT Test

- The overall class student's performance in CAT with respect to the Threshold % for individual Course Outcomes (COs) is depicted in the table below.

CEC4106 GIS and its applications- Threshold Attainment for CAT Test

SI No.	CO Code	Statement	TEE Threshold %	Threshold based Attainment %	Average based Attainment %
1	CO1	List the different components of gis and to identify different elements of a map.	50.00%	99.50%	82.00%
2	CO2	Create raster, vector layers and to generate and create error free spatial data with its attributes.	50.00%	99.50%	81.00%
3	CO3	Generate spatial queries and analysis and to identify the outputs achieved.	50.00%	99.50%	77.50%
4	CO4	Solve real world problems on business development, electric utilities and mobile gis through spatial analysis.	50.00%	99.50%	73.00%

The Course Attainment achieved for the course CEC4106 GIS and its applicationsthrough CAT test is **99.50%.**

RRN											

SEMESTER END EXAMINATIONS – JANUARY 2022

Programme & Branch	:	**B. Tech., CIVIL ENGINEERING**		
Semester	:	**VII**	Date & Session :	**20/01/2022 FN**
Course Code & Name	:	**CEC4106 GIS and its applications**		
Duration	:	**120 minutes**	Maximum Marks :	**100**

ANSWER ALL QUESTIONS

	PART A (20 X 2 = 40 MARKS)	**Course Outcome**
1.	State the importance of map scale in preparation of thematic maps.	1
2.	List the different types of vector data.	1
3.	What is the difference between data and information?	1
4.	Write the various developable surfaces that are used in map projection.	1
5.	Give the different aspects of cylindrical projection.	1
6.	Expand ADRG and KML.	2
7.	Enlist the various types of spatial data models.	2
8.	Write the different elements of topological relationship.	2
9.	Differentiate between accuracy and precision in GIS data.	2
10.	What is the necessity of using topology in GIS data?	2
11.	Differentiate between spatial data querying and non-spatial data querying.	3
12.	Enlist the various functions that are used to describe the topography of an area.	3
13.	Write the characteristics of Triangulated Irregular Network (TIN).	3
14.	What is meant by viewshed analysis?	3
15.	What are the boolean operators that are involved in intersection and union overlay in GIS?	3
16.	List any two applications in natural resources management.	4
17.	Write the role of NGOs in disaster mitigation and management.	4
18.	How will you determine the air pollution index?	4
19.	Enlist the advantages of using WebGIS.	4
20.	Why do we integrate GPS with mobileGIS?	4

PART B (3 X 20 = 60 MARKS)

ANSWER ANY THREE QUESTIONS

21.	(i)	Elaborate on different types of map projections that are classified based on the following criteria: a) Position of light source b) Method of construction c) Development surface used d) Projection properties	**(20)**	1
22.	(i)	Explain in detail about the types of geospatial standards, objectives & levels of standardization in geospatial data and organizations involved in setting up geospatial data standards.	**(10)**	2
	(ii)	Illustrate the various data quality improvement techniques in GIS.	**(10)**	2
23.	(i)	Explain about the concept of DEM, DTM, DSM and TIN.	**(10)**	3
	(ii)	Elucidate on overlaying operations such as raster based overlay and vector based overlay with suitable examples.	**(10)**	3
24.	(i)	What is meant by watershed management? Illustrate the few problems that are related to poor watershed management. Discuss the usage of GIS to eradicate these problems with a case study explanation.	**(20)**	4
25.	(i)	There has been a huge forest fire in the Western Ghats region. If you were the district collector of the region, how you would use GIS in planning, mitigation, preparedness, response and recovery.	**(20)**	4

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**Name & Signature
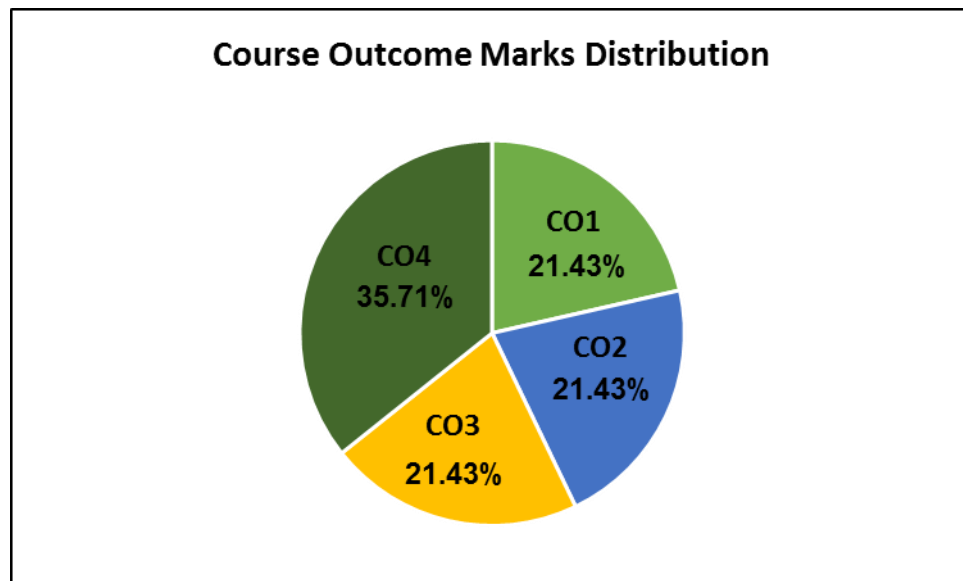of Course faculty**
(K. KANMANI)

**Name & Signature
of DAAC Member**
(Dr. P. VASANTHI)

CEC4106 GIS and its applications- End Semester Examination final audited Question Paper

CEC4106 GIS and its applications- Course Outcome Marks Distribution

COs Level	Marks Distribution (X)	% Distribution
CO1	30.00	21.43 %
CO2	30.00	21.43 %
CO3	30.00	21.43 %
CO4	50.00	35.71 %
Total	**140.00 (Y)**	**100.00 %**

Course Outcome Marks Distribution

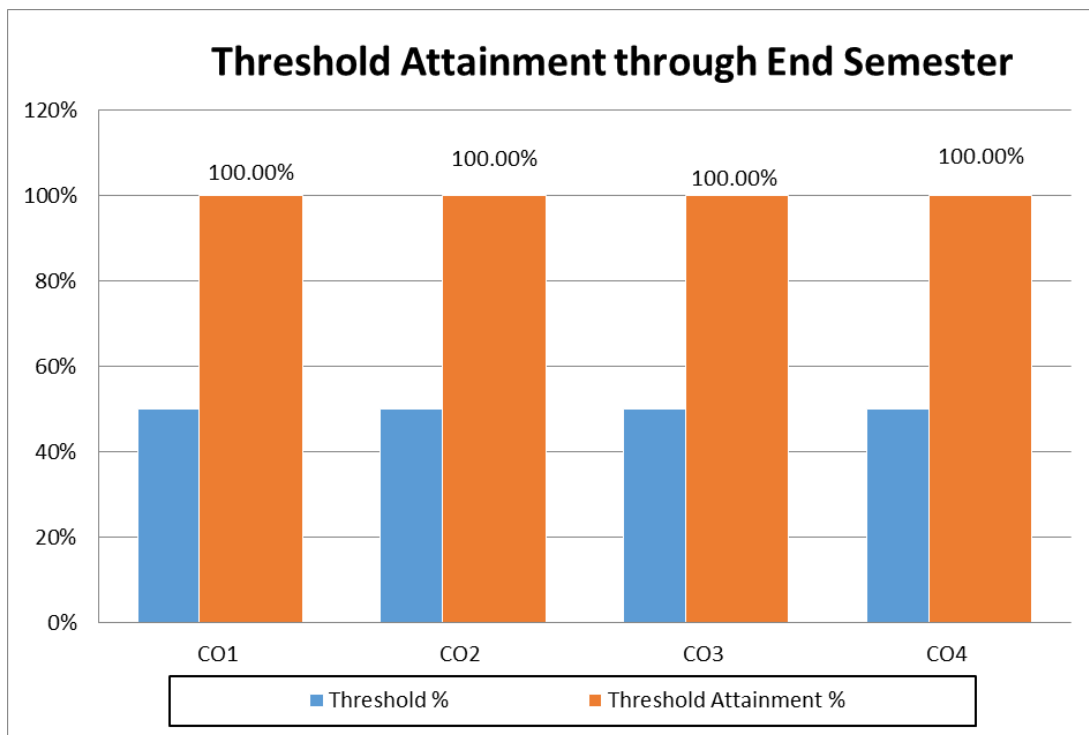**CEC4106 GIS and its applications- Course Outcome Marks Distribution**

CEC4106 GIS and its applications– End Semester Marks Entry in IONCUDOS

student_us	student_name	1(2.00)	2(2.00)	3(2.00)	4(2.00)	5(2.00)	6(2.00)	7(2.00)	8(2.00)	9(2.00)	10(2.00)	11(2.00)	12(2.00)	13(2.00)	14(2.00)	15(2.00)	16(2.00)	17(2.00)	18(2.00)	19(2.00)	20(2.00)
170011601001	A. AATHIL RASOOL	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601002	AADHIL. K	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601003	AAKASH RAJ THILAK N	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601004	ABDUL KALAM M	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601005	ABDUR RAHMAN QURESHI	2	2	2	2	2	2	2	2	2	2	1		1	1	2		2		2	
170011601006	ABISHAKE R	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601007	ABYAZ AIMAN A	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601008	AHAMED ASHFAR J	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601009	AHMAD AL MUBEEN K N	2	2	2	2	2	2	2	2	2	2	2		2	2	2	1	2	2	2	
170011601010	AJAY M		2	2	2	2	2	2			2					2	2	2	2	2	
170011601011	AMARNATH S	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601012	APSARKHAN P.	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601013	ARAFAT WAHITHA N	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601014	DEEKSHANA G	2	2	2	2	2	2	2	2	2	2	1		1	1	2	2	2	2	2	
170011601015	DHARMA R B	2	2	2	2	2	2	2	2	2	2	1		2	2	2	2	2	2	2	
170011601016	ESSAM MOHAMED S	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601017	FAYAAZ RIZWAN.M	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	
170011601018	FAYAZ AHAMED.I	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601019	HRITHICK RAHUL G	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	2	2	
170011601020	IBRAHIM ADUHAM S N		2	2	2	2	2	2	2	2	2					2	2	1	1	1	
170011601022	JONNALA THARUN REDDY	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601023	KAARTHIKEYAN G M	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601024	KANNAN. K	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601025	KARTHEKEYAN M A P	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601027	KISHORE V	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601028	KOMESHWARAN.P	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601030	MOHAMED ARSATH S.A.	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	
170011601031	MOHAMED AZARUDEEN.M	2	2	2	2	2	2	2	2	2	2	1		1	1	2	1	2	1	2	

student_us	student_name	21(20.00)	22a(10.00)	22b(10.00)	23a(10.00)	23b(10.00)	24(20.00)	25(20.00)	grand_total_m
170011601001	A. AATHIL RASOOL	18	9	8	9	8			84
170011601002	AADHIL. K	18	8	8	8	8			82
170011601003	AAKASH RAJ THILAK N	18	9	9					68
170011601004	ABDUL KALAM M	18	8	8	8	7			81
170011601005	ABDUR RAHMAN QURESHI	16	8	8	8	2			72
170011601006	ABISHAKE R	18	9	9	9	9			86
170011601007	ABYAZ AIMAN A	18	9	9	9				77
170011601008	AHAMED ASHFAR J	18	8	7					65
170011601009	AHMAD AL MUBEEN K N	18	9	9	9				81
170011601010	AJAY M	19	9	10				20	84
170011601011	AMARNATH S	18	9	8	8	8			83
170011601012	APSARKHAN P.	17	8	8	7	8			80
170011601013	ARAFAT WAHITHA N	18	9	8	9	9			85
170011601014	DEEKSHANA G	19	9	9	9	9			90
170011601015	DHARMA R B	19	9	9	9	9			92
170011601016	ESSAM MOHAMED S	18	7	8	9				74
170011601017	FAYAAZ RIZWAN.M		10						46
170011601018	FAYAZ AHAMED.I	18		9	9	2			70
170011601019	HRITHICK RAHUL G	18	9	9					70
170011601020	IBRAHIM ADUHAM S N	18	8	8	8	8			77
170011601022	JONNALA THARUN REDDY	18	9	8					67
170011601023	KAARTHIKEYAN G M	18	9	9					68
170011601024	KANNAN. K	18	9	9	9				77
170011601025	KARTHEKEYAN M A P	18	9	9	9	3			80
170011601027	KISHORE V	18			9	8			67
170011601028	KOMESHWARAN.P	18	8	8	9	8			83
170011601030	MOHAMED ARSATH S.A.	17	9	8	9	8			83
170011601031	MOHAMED AZARUDEEN.M	15	7	8	8	8			78

- The overall class student's performance with respect to the Threshold % for individual Course Outcomes (COs) is depicted in the graph below.

Threshold Attainment through End Semester

CEC4106 GIS and its applications– Threshold Attainment for End Semester Examination

- The overall class student's performance with respect to the Threshold % for individual Course Outcomes (COs) is depicted in the table below.

CEC4106 GIS and its applications- Threshold Attainment for End Semester Examination

SI No.	CO Code	Statement	TEE Threshold %	Threshold based Attainment %	Average based Attainment %
1	CO1	List the different components of gis and to identify different elements of a map.	50.00 %	100.00%	92.14%
2	CO2	Create raster, vector layers and to generate and create error free spatial data with its attributes.	50.00 %	100.00%	89.96%
3	CO3	Generate spatial queries and analysis and to identify the outputs achieved.	50.00 %	100.00%	78.68%
4	CO4	Solve real world problems on business development, electric utilities and mobile gis through spatial analysis.	50.00 %	100.00%	75.56%

The Course Attainment achieved for the course CEC4106 GIS and its applications through End semester examination is **100 %**
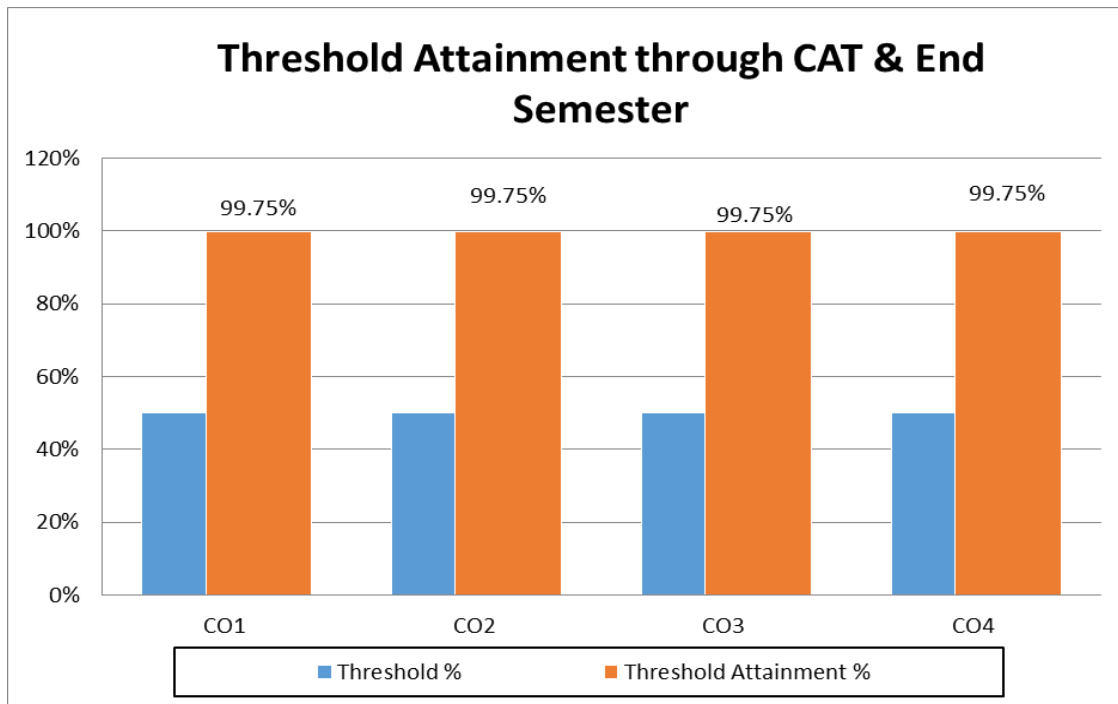
Threshold Attainment through CAT & End Semester

CEC4106 GIS and its applications– Threshold Attainment for CAT and End Semester Examination

CEC4106 GIS and its applications- Threshold Attainment for CAT and End Semester Examination

SI No.	CO Code	Statement	TEE Threshold %	Threshold based Attainment %	Average based Attainment %
1	CO1	List the different components of gis and to identify different elements of a map.	50.00 %	99.75%	87.07%
2	CO2	Create raster, vector layers and to generate and create error free spatial data with its attributes.	50.00 %	99.75%	85.48%
3	CO3	Generate spatial queries and analysis and to identify the outputs achieved.	50.00 %	99.75%	78.09%
4	CO4	Solve real world problems on business development, electric utilities and mobile gis through spatial analysis.	50.00 %	99.75%	74.28%

The Course Attainment achieved for the course CEC4106 GIS and its applicationsthrough CAT and End semester examination is **99.75%.**

The attainment levels of COs are categorized as:
- Average - < 50%
- Moderate - 51 to 80%
- Excellent - > 80%

Thus the Course Outcome (CO) attainment achieved for the course CEC4106 GIS and its applications is **excellent.**

PO ATTAINMENT

Attainment of POs & PSOs (Direct Method: Student Performance) – B.Tech Civil Engineering 2017-21 batch

COURSE	PO 1 %	PO 2 %	PO 3 %	PO 4 %	PO 5 %	PO 6 %	PO 7 %	PO 8 %	PO 9 %	PO 10 %	PO 11 %	PO 12 %	PSO 1 %	PSO2 %	PSO 3 %
7 – Semester															
GIS and its applications (CEC4106)	99.50	99.50	92.27	59.70	99.50	72.97	72.97		39.80	39.80	59.70	39.80		59.70	99.50
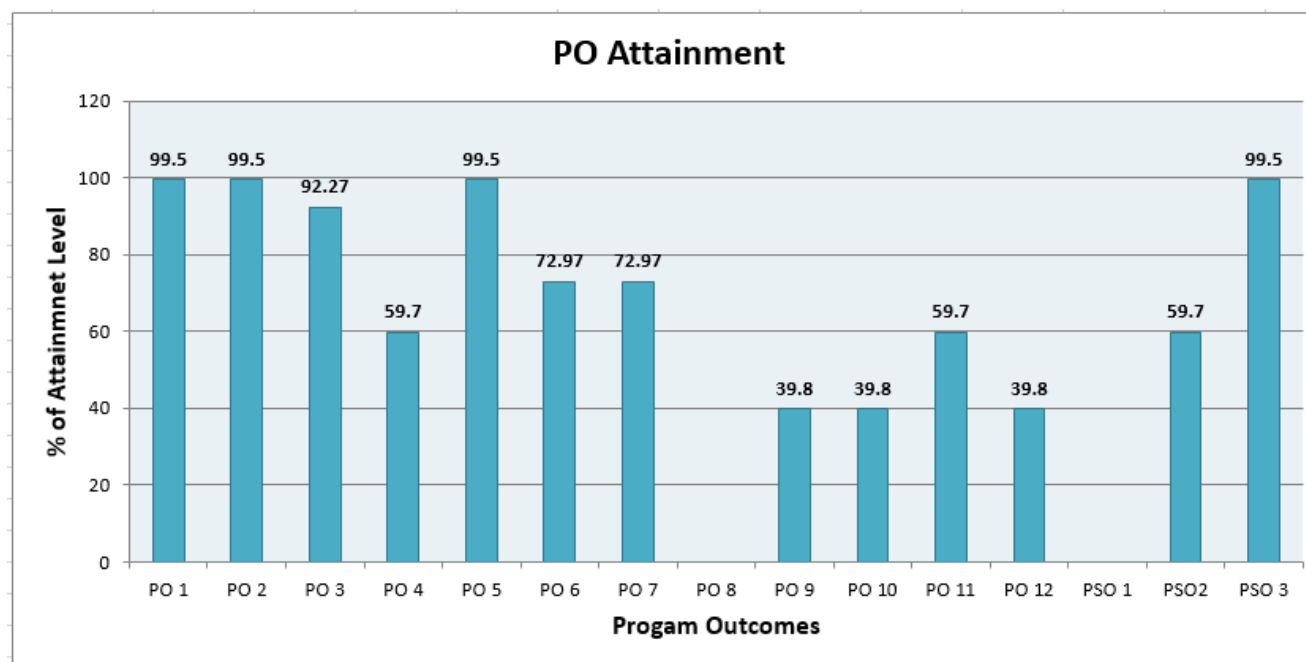
Attainment of POs & PSOs – Direct Method (Students Performance) for the course CEC4106 GIS and its applications