

 Estd. 1962 "A" Accredited by NAAC(2021) With CGPA 3.52	SHIVAJI UNIVERSITY, KOLHAPUR - 416 004, MAHARASHTRA PHONE : EPABX – 2609000, www.unishivaji.ac.in, bos@unishivaji.ac.in शिवाजी विद्यापीठ, लिहापूर - ४१६ ००४, महाराष्ट्र दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दूरध्वनी विभाग ०२३१-२६०९०९३/९४	
---	---	---

SU/BOS/Sci & Tech/ 84

Date: 22/11/2022

To,

The Head,
Departments of Technology,
Shivaji University,
Kolhapur.

Subject: Regarding syllabi of Certificate Course on Advanced Surveying With Total Station & DGPS.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi, Certificate Course. on Advanced Surveying With Total Station & DGPS.

This syllabi shall be implemented from the academic year 2022-2023 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (Online Syllabus)

You are, therefore, requested to bring this to the notice of all students and teachers concerned.
Thanking you,

Yours faithfully,

Dy Registrar

Copy to:

1	The Dean, Faculty of Science and Technology	7	P.G.Seminar Section
2	Director, Board of Examinations and Evaluation	8	Computer Centre
3	The Chairman, Respective Board of Studies	9	Affiliation Section (U.G.)
4	B.Sc. Exam	10	Affiliation Section (P.G.)
5	Eligibility Section	11	P.G.Admission Section
6	Appointment Section		

Advanced Surveying with Total Station & DGPS

Certificate Course on ADVANCED SURVEYING WITH TOTAL STATION & DGPS



**Submitted By
Department of Technology,
Shivaji University,
Kolhapur.**

Advanced Surveying with Total Station & DGPS

A) Preamble:

Shivaji University, Kolhapur's Dept. of Technology has been involved in research in various aspects of technological development. Along with the time it deals with different research problems for betterment of the society & it has enabled the University to produce eminent professionals engaged in different Governmental and Non Governmental organization in the country.

The department is manned with scientists, technologists and social scientists and have well-developed infrastructure to facilitate different experiments in relevant areas. It now ventures in running a Two months Certificate course on **Advanced Surveying with Total Station & DGPS**. The course is designed by qualified personalities not only from Shivaji University but also by leading professionals and expert faculties from various noted institutions and industries of the country.

The ultimate goal is to educate the up and coming leaders in the industry, to equip them with the very latest knowledge and skills to lead and innovate within their organizations, improving the performance, efficiency and sustainability of the construction sector.

Total station surveying is used in all surveying applications in India to this day. Total stations are used for channels to generate construction, cadastral surveys, tunnel surveys, road surveys, L-Sections, and Cross Sections.

In this course, you will learn advanced surveying terms using a total station. Following the concept lecture, there will be hands-on field exercises to help you acquire the practical understanding and basic skills needed to work in the surveying industry.

An enhanced version of the Differential Global Positioning System improves position accuracy from a nominal GPS accuracy of 15 meters (49 feet) to approximately 1-3 centimeters (0.39-1.18 inches) in the best implementation over the operating range of each system. Each DGPS uses a network of fixed ground reference stations to transmit the difference between the position reported by the GPS satellite system and the known

Advanced Surveying with Total Station & DGPS

fixed position. These stations transmit the difference between the satellite's measured pseudo-distance and the actual (internally calculated) pseudo-distance, and the receiving station can correct those pseudo-distances by the same amount.

B) Academic Duration of Course:

- The duration of the course is 1 month in same academic year.
- The lectures will be delivered, four hours & practical of eight hours per week.
- The course will be conducted on Saturday & Sunday.
- These timings will be suitable for students and Workings employees from industry.

B) Course structure:

Candidates will be required to undergo learning in theory & hands-on training.

C) Expertise Available:

Implementation of this type of course is new to the university; therefore very few experts from various departments of University are available to teach such course. But the experts from industrial sector and engineering colleges can be invited for lectures.

D) Space Required:

The course includes theory and practical training. The theory part can be taught in the Department of Technology, Shivaji University, Kolhapur. The remaining part of practical training can be completed on field. The department has well equipped teaching classrooms and Laboratories for the practical. A special necessary laboratory will be established in Dot.

Advanced Surveying with Total Station & DGPS

E) Eligibility for admission:

- The students having science and engineering background will be eligible i.e. any 12th pass student from Science, and diploma in Engineering and Technology (Diploma in Civil /Mechanical/ Chemical Engineering/Architecture approved by BTE, Maharashtra or equivalent) will be eligible.
- On roll students of Second, Third & Final Year B.E/ B.Tech with above specialization from Department of Technology as well as from any of the affiliated Engineering Colleges are also eligible to join this course.
- Priority will be given to students from Shivaji University (60%) and others (40%).
In case applicant number is more, the entrance test will be conducted.

F) Examination:

The students will be assessed at the end of course through orals, tests, tutorials, etc. The evaluation will consist of internal assessment and oral based on theory/practical.

G) Intake Capacity:

Maximum 60 students in which priority will be given to the university students (60%) and others (40%).

H) Fee Structure:

Particulars	Annual Fee (Rs.) for Non-DOT Students	Annual Fee (Rs.) for DOT Students
a. Tuition Fee	3000.00	1500.00 (50% Discount)
b. Laboratory Fee	2000.00	2000.00
Course Fee per student	5000.00	3500.00

Other fee will be applicable as per university rules/norms.

Advanced Surveying with Total Station & DGPS

ANNEXURE– I

Budget: Non-recurring (e .g .Equipments, Accessories etc.)

Sr. No	Item	First Year	Total in Rs.
1.	Models and Charts	10000=00	10000=00
2.	Equipments/ Software	200000=00	200000=00
Total			Rs. 210000=00

ANNEXURE– II

Man Power:

Sr. No.	Position	Consolidated Emolument	Total in Rs.
1.	Teaching Assistance (1)	Rs. 8000/month	96000=00
2.	Course Coordinator	Rs. 2000/month	24000=00
3.	Honorarium to contributory teachers, industrial experts and T.A. (Rs. 600 x 144 lecture)	--	86400=00
4.	Honorarium to contributory teachers, industrial experts and T.A (Rs. 300 x 288 practical hours)	--	86400=00
Total			Rs. 292800=00

ANNEXURE– III

Miscellaneous:

Sr. No.	Budget Head	Total (Rs.)
1.	Stationary	10000=00
2.	Miscellaneous	10000=00
Total		Rs. 20000=00

Total Budgetary provisions for the first year will be :

Sr. No.	Budget Head	Total (Rs.)
1.	Total of Annexure - I	Rs. 210000=00
2.	Total of Annexure - II	Rs. 292800=00
3.	Total of Annexure - III	Rs. 20000=00
Total		Rs. 522800=00

I) Budgetary Provisions:

A general budgetary provision to be made for buying models and some equipments and software is given in Annexure I whereas teaching assistance, course coordinator and contributory teacher's honorarium including honorarium of industrial experts required is given in Annexure II. The miscellaneous expenses and stationary charges required are given in Annexure III. The secretarial staff required to start this course is available in the Department of Technology.

Advanced Surveying with Total Station & DGPS

SYLLABUS

Course : ADVANCED SURVEYING WITH TOTAL STATION & DGPS		
Instructional Hours	Theory: 12	Practical / Tutorial/Drawing : 24

Course Objective: The student will learn advanced surveying terms using a total station. Following the concept lecture, there will be hands-on field exercises to help acquire the practical understanding and basic skills needed to work in the surveying industry.

Unit I	Introduction to advance surveying
	• Introduction to advance surveying: Concepts, Importance & Necessity of Advance Surveying. • Study of different surveying methods and instruments, Maps Projections and types, Coordinate System and Transformations.
Unit II	Surveying with Dumpy Level & Theodolite
	• Introduction, Concepts, Mechanism and Pre requirements of the Dumpy Level, • Instrument handling and setting, Field work, Survey data post processing, Survey data applications. • Introduction, Concepts, Mechanism and Pre requirements of the Theodolite survey, • Instrument handling and setting, Field work, Survey data post processing, Survey data applications.
Unit III	Surveying with GPS& DGPS Survey
	• Introduction of GPS : Concepts, Mechanism and Pre requirements of the GPS Survey, Coordinate and time systems, Satellite orbital motions, GPS observables, • Estimation procedures, Propagation medium, Methods of post processing GPS data, Instrument handling and setting, Field work, Survey data post processing, Survey data applications. • Introduction to Differential GPS (DGPS): Principle, Concepts and Function, Dual and Single Frequency DGPS, RTK and Static Surveys in DGPS, • Use of DGPS in Topographical Survey, Base, Rover, DGPS Connections and Settings, • Field Work: Point data collection (Easting, Northing and Height), Electronic Distance Measurement Survey, Area Measurement Survey Height Measurement Survey, Survey Data Post Processing Survey Data Applications.
Unit IV	Total Station and Survey
	• Introduction to Total Station: Principle and Function, REM, RDM, Use of Total station for data processing and analysis, Field work: Point data collection (Easting, Northing and Height), • Electronic Distance Measurement Survey, Area Measurement Survey Height Measurement Survey, Survey Data Post Processing, Survey Data Applications.

Advanced Surveying with Total Station & DGPS

	Reference Books
1.	Basak, N. N. (1994): Surveying and Levelling, Tata McGraw-Hill Education, Delhi
2.	Bhavikatt , S. S. (2009): Surveyingand Levelling, I. K. International, New Delhi
3.	Mohinder, S. G., Lawrence, R. W. and Angus, P. A. (2001): Global Positioning Systems, Inertial Navigation and Integration, John Wiley and Sons Inc., New York
4.	Satheesh, G., Sathikumar, R. and Madhu, N. (2007): Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson Education, Delhi
5.	Satheesh, G., Sathikumar, R. and Madhu, N. (2007): Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson Education, Delhi