



MAHATMA GANDHI UNIVERSITY

MGU/SES/ RSGIS/2022- 23/ETEN/01

Dated: 25/11/2022

NOTICE INVITING TENDER

(Tender No. MGU/SES/ RSGIS/2022- 23/ETEN/01)

The Registrar, Mahatma Gandhi University, Kottayam for and on behalf of **Director, School of Environmental Sciences, Mahatma Gandhi University, Kottayam** invites online bid (technical and financial bid) for the supply and installation of the following equipments from reputed firms

1	Name of the scientific equipment	UAV/ DGPS/ Total Station/ Data Processing Software/ High End Computer System (Specifications are mentioned in the table below)
2	Earnest money deposit (EMD)	Rs. 50,000/-
3	Tender submission fee	Rs. 7,500/-
4	Period of supply and installation	Within 30 days from the L/C opening date
5	Mode of submission of Bid	Online
6	Tender Documents	Can be downloaded from the website www.etenders.kerala.gov.in
7	Last date and Time of submission of tender by online	12/12/2022 4:00 pm
8	Last date and Time of submission of relevant documents by speed post	14/12/2022 4:00 pm
9	Date and time of opening of bid opening	14/12/2022 4:00 pm

Table: Specifications

**Column-4 (Compliance/Deviation Statement) must be filled by the bidder
Item Ia: Technical Specification of Unmanned Aerial Vehicle (UAV- Drone):**

	Manufacturer		
	Model Name		
SI. No:	PARAMETERS	REQUIRED SPECIFICATIONS / REMARKS	#COMPLIANCE/ DEVIATION STATEMENT
1	Physical Characteristics		
a.	Role of RPA	Multi-roll, Multi-Spectral/Surveillance/Survey Drones	
b.	Physical dimensions	536 mm x 536 mm x 320 mm	
2	UAV performance characteristics		
a.	Endurance per flight	35 mins of operation time with payload**	
b.	Range	3 Kilometers	
c.	Maximum Take-off altitude	6000 m ASML (Above Mean Sea Level)	
d.	Maximum operating altitude	120 m AGL (Above Ground Level as per DGCA regulations)	
e.	Working Temperature Range	0°C to +60°C	
f.	Wind Resistance	Up to 8 m/s	
3	Operational Characteristics		
a.	Launch	Vertical Take-Off & Landing	
b.	Flight Modes	Position Hold Mode Autonomous waypoint Navigation Mode (Auto Mode) Emergency Return to Launch Mode	
c.	Propulsion system	Electric propulsion system	
d.	Fail Safe (FS system)	Return to base on communication failure Return to base/land on low battery	
e.	Packaging	Standard casing for the RPA & Peripherals	
f.	Operating crew	1-2 person per system	
4	Payload Characteristics		
a.	Payload	Sony 24 MP Camera	
b.	Payload Replacement Time	< 2 minutes	

c.	Payload Type	Survey Grade RGB Camera	
d.	Weight	390 Grams	
e.	PPK	Emlid M2	
f.	PPK Band	Dual Band L1 L2	
5	NPNT features**		
a.	Permission artefact	Verification and Validation of permission and authenticity of the artefact	
b.	Flight Logs	Individual and bundled logs stored as per formats mentioned by DGCA	
c.	Geo-fence and Time fence	Return to home in case of a breach of either Geo-fence, Time fence or both	
d.	Secure provision of keys	Keys are highly secured in special hardware security module with tamperproof ability	
e.	Tamper responsiveness	Overall shutdown of system in case of detecting hardware tamper implanted through a perimeter mesh	
f.	NPNT Ready	Yes	
6	Communication Link Characteristics		
a.	C-2 Link	Transmit control commands from GCS to UAV Transmit telemetry data from UAV to GCS	
b.	Frequency Band	2.4 GHz Up-link and Down-link	
7	Ground Control Station (GCS) Characteristics		
a.	GCS Hardware	Radio controller/Tablet	
b.	Display	Geographic map along with UAV location, Flight plan Display of important parameters: Battery Capacity Distance from home Waypoints	

		Artificial horizon indicating UAV altitude	
c.	Maps	Standard google maps with selectable layers of Satellite and street view	
d.	User Controls	Set altitude of the UAV Waypoint Navigation Dynamic flight plan adjustment Position hold mode which allows UAV to be flown in semiautonomous mode	
e.	Pre-flight checks	Integrated electronic pre-flight checklist	
f.	Others	Essential telemetry data logging. Export to flight path in Kml format for reviewing in google earth	
8	Other Parameters		
a.	Training	2 persons per UAV Duration: 3 days at client location	
b.	Handholding/Troubleshooting	Aftersales support team would be available on phone as well as E-mail	
c.	DGCA operational guidelines	Support to customer in complying with DGCA operational guidelines	
d.	Warranty	One year	
9	Mandatory Compliance (If the bidder unable to fulfill the requirement then the bid will be rejected)		
e	Drone Type Certificate and UIN number registration with DGCA	Supplier should attach the Type Certificate and UIN number.	

Item I b: UVA Image Processing Software Specification:

SI. NO.	DRONE IMAGE PROCESSING SOFTWARE	#COMPLIANCE/ DEVIATION STATEMENT
1	Loading Images	
2	Inspecting Loaded Images, Removing Unnecessary Images	

3	Aligning Cameras	
4	Building Dense Point Cloud	
5	Building Mesh (3D polygonal model)	
6	Generating Texture	
7	Exporting Results	
8	Editing Point Clouds	
9	Camera Orientation	
10	Ortho Photo Generation	
11	DTM Generation	
12	DSM Generation	
13	Report Export	

Item I c: UVA based GIS analysis Software Specification:

Sr. No.	General Features	Compliance Yes/No
1	Multiple Document Interface (MDI)	
	• Project, View and Layer Management	
	• Geo-Linked Multiple Views	
	• Well known Raster, Vector and Tabular file formats support	
	• On the Fly Map Projection Transformation	
	• Large set of Library for Projection & Geographic Coordinate System	
	• Advance Map Navigation and Visualization	
	• Seamless data handling using ORDBMS	
	• Identification and Measurement Tools	
	• Customizable GUI	
	• Extensive Map Composition Tool	
• Raster and Vector Catalogue		
2	GIS Features	
	• Advance Drawing and Editing	
	• Topology Creation	
	• Edge Matching and Rubber Sheeting	
	• Geometric Correction	
	• Database Management	
	• Query Builder for Simple and Complex Query	
• Legend Creator for thematic mapping		

	<ul style="list-style-type: none"> • A large library of symbols 	
	<ul style="list-style-type: none"> • Rule Based Labelling and Annotation 	
	<ul style="list-style-type: none"> • Geo-processing and Overlay Analysis 	
	<ul style="list-style-type: none"> • Vector to Raster 	
	<ul style="list-style-type: none"> • Advanced Report Generation with wizard 	
3	Image Processing Features	
	<ul style="list-style-type: none"> • Image Enhancement and Filtering 	
	<ul style="list-style-type: none"> • Image Analysis Tools 	
	<ul style="list-style-type: none"> • Image Geo-referencing 	
	<ul style="list-style-type: none"> • Image Extraction and Mosaicking 	
	<ul style="list-style-type: none"> • Atmospheric and Radiometric Correction 	
	<ul style="list-style-type: none"> • Image Transformation 	
	<ul style="list-style-type: none"> • Image Classification 	
	<ul style="list-style-type: none"> • Advance Segmentation 	
	<ul style="list-style-type: none"> • Advanced Change Detection 	
	<ul style="list-style-type: none"> • Raster To Vector 	
4	Network Analysis	
	<ul style="list-style-type: none"> • Defining Network Rules 	
	<ul style="list-style-type: none"> • Add Network Location 	
	<ul style="list-style-type: none"> • Remove Network Location 	
	<ul style="list-style-type: none"> • Find Shortest and Optimum Path 	
	<ul style="list-style-type: none"> • Location Analysis 	
	<ul style="list-style-type: none"> • Multi Location Analysis 	
	<ul style="list-style-type: none"> • Service Area 	
	<ul style="list-style-type: none"> • Dynamic Segmentation 	
5	3D Analysis	
	<ul style="list-style-type: none"> • Terrain Extraction 	
	<ul style="list-style-type: none"> • Flythrough & Walkthrough Creation 	
	<ul style="list-style-type: none"> • Drape Raster, Vector and 3D Object 	
	<ul style="list-style-type: none"> • Line of Sight and Radio Line of Sight 	
	<ul style="list-style-type: none"> • View Shed Analysis 	
	<ul style="list-style-type: none"> • Stereo Viewing 	
	<ul style="list-style-type: none"> • Environmental Effect Like Fog, Fire, Cloud, Sun, etc 	
	<ul style="list-style-type: none"> • Particle emitter 	
	<ul style="list-style-type: none"> • Save Image & Animation [* .avi] 	
6	Raster GIS Analysis	

	<ul style="list-style-type: none"> • Spatial Analysis 	
	<ul style="list-style-type: none"> • Distance Tools: 	
	<ul style="list-style-type: none"> • Math Tools 	
	<ul style="list-style-type: none"> • Conditional Tools 	
	<ul style="list-style-type: none"> • Extraction Tools 	
	<ul style="list-style-type: none"> • Local 	
	<ul style="list-style-type: none"> • Generalization 	
	<ul style="list-style-type: none"> • Multivariate 	
	<ul style="list-style-type: none"> • Neighbourhood 	
	<ul style="list-style-type: none"> • Weighted Overlay 	
7	Terrain Analysis	
	<ul style="list-style-type: none"> • DEM to Contour and DEM from Point and Contour Line 	
	<ul style="list-style-type: none"> • Slope and Aspect 	
	<ul style="list-style-type: none"> • Hill Shade and Topographic Normalize 	
	<ul style="list-style-type: none"> • Cut & Fill Analysis 	
	<ul style="list-style-type: none"> • View Shed, Route Indivisibility and Line of Sight 	
	<ul style="list-style-type: none"> • Best Path 	
	<ul style="list-style-type: none"> • Area/Volume Calculation 	
	<ul style="list-style-type: none"> • Hypsometry 	
	<ul style="list-style-type: none"> • Semi Variance 	
	<ul style="list-style-type: none"> • Surface Specification Points 	
	<ul style="list-style-type: none"> • Anaglyph 	
8	Global Positioning System	
	<ul style="list-style-type: none"> • Interface with GPS device 	
	<ul style="list-style-type: none"> • GPS Tracking and Navigation 	
	<ul style="list-style-type: none"> • Extract feature using GPS 	
	<ul style="list-style-type: none"> • Simulate GPS file 	
	<ul style="list-style-type: none"> • GPS data validation 	
	<ul style="list-style-type: none"> • GPS error correction 	
	<ul style="list-style-type: none"> • Satellite sky-view 	
	<ul style="list-style-type: none"> • Speed and Bearing Indication 	
	<ul style="list-style-type: none"> • Way-Path generation and storing 	
	<ul style="list-style-type: none"> • Geo-fencing 	
	<ul style="list-style-type: none"> • Different File formats support 	
	<ul style="list-style-type: none"> • Export to KML/KMZ 	
9	Tracking Analysis	

	<ul style="list-style-type: none"> • Simulate and analyse time-based data 	
	<ul style="list-style-type: none"> • Report on patterns related to time and defined rules. 	
	<ul style="list-style-type: none"> • Monitoring of mobile resources 	
	<ul style="list-style-type: none"> • Analyse patterns of movement 	
10	Neural Network Classification	
	<ul style="list-style-type: none"> • Supervised and Unsupervised Classification 	

Item I d: Drone Image Processing Hardware Specification:

Sl. NO.	HARDWARE SPECIFICATION	#COMPLIANCE/ DEVIATION STATEMENT
1	CPU : Intel Core i7	
2	Graphic Card : 4GB	
3	Ram: 8GB	
4	Storage 1TB	
5	1 Mouse and 1 keyboard	
6	Cables: must have all required cables	

Item II: Technical Specification of DIFFERENTIAL GLOBAL POSITIONING SYSTEM (DGPS) 1BASE + 1ROVER+ FULL ACCESSORIES :

S.NO.	DGPS PARAMETERS	TECHNICAL SPECIFICATIONS	#COMPLIANCE/ DEVIATION STATEMENT
1	Channels	Above 1000 channels	
	Satellites	GPS	
		GLONASS	
		Galileo	
		BeiDou	
		SBAS	
		QZSS	
2	GNSS Accuracies		
3	Real time kinematics	Horizontal: 8 mm + 1 ppm RMS	

	(RTK)	Vertical: 15 mm + 1 ppm RMS	
		Initialization time: < 10 s	
		Initialization reliability: > 99.9%	
4	Post-processing kinematics (PPK)	Horizontal: 3 mm + 1 ppm RMS	
		Vertical: 5 mm + 1 ppm RMS	
5	Post-processing static	Horizontal: 2.5 mm + 0.5 ppm RMS	
		Vertical: 5 mm + 0.5 ppm RMS	
6	Code differential	Horizontal: 0.4 m RMS	
		Vertical: 0.8 m RMS	
	Autonomous	Horizontal: 1.5 m RMS	
		Vertical: 2.5 m RMS	
7	IMU update rate	200 Hz	
8	Hardware		
	Ingress protection	IP67 or above	
9	Communication	GSM	
		Wi-Fi	
		Bluetooth	
10	Ports	General Support	
11	UHF radio	Standard Internal Type	
		Range: Min 3KM	
12	Data formats	RTCM	
		RINEX	
		NMEA	
		NTRIP	
13	Electrical		
	Li-ion battery capacity	Built-in battery 6,600m Ah	
	Operating time on internal battery (5)	14h (Typical for continuous operation at 500nits brightness)	
	Charging	Default 5 V/2 A, support quick charge	

Item No: III. Technical Specifications of TOTAL STATION + FULL ACCESSORIES

SI.NO.	TOTAL STATION TECHNICAL SPECIFICATIONS	#COMPLIANCE/ DEVIATION STATEMENT
1	TS03 5"(1.5mgon) R500, total station with reflector less R500 EDM, R232 interface, USB stick/SD card interface, 4GB Internal Flash Memory, 1GB SDRAM, laser plummet, full numeric keyboard with 3.5" QVGA black and white display, Quick guide, and container with protective cover, lens hood and cleaning cloth.	

2	GDF311, Tribrach without optical plummet, professional 3000 series, pale green.	
3	GST05 Wooden light tripod with side clamp screws, carrying strap	
4	GKL311 Single-bay Charger Professional 3000. Charger for one Li-Ion battery (GEB211, GEB212, GEB221, GEB222, GEB241, GEB242 and GEB333), including AC/DC adaptor and cigarette lighter cable	
5	GEB334 3-cell Lithium-Ion battery, 10.8V/3450mAh rechargeable for TS03/TS07/TS10, GS18 and LS10/LS15	
6	GPR111, Circular prism with holder and target plate.	
7	GLS11 Reflector pole, telescopic, with circular bubble, cm and ft graduation, extends to 2.15m	
8	GMP111 Miniprism with minipole	

(i) Additional requirements:

- 1.Registration of UAV as per DGCA guidelines.
- 2.Software for post-processing RGB images.
- 3.On-site demonstration and training of UAV with payloads and software must be provided by the vendor during the installation stage.

(ii) Mandatory requirements:

The UAV/Drone model should be compliance with the Unmanned Aircraft System Rules, 2021 and its type and class have a valid certificate of manufacture and airworthiness issued by the Director General of Civil Aviation, GOVT of INDIA.

(iii) Evaluation Criteria:

Evaluation shall be done on“QCBS”system:

Total and ed costto Mahatma Gandhi University, Kerala on equipment(all items included)with standard warranty

(iv) Pre-Qualification Criteria:

- 1.Bidder’s average turnover should be 5 Cr for last 3 financial years
- 2.Bidder/OEM should have supplied Drone for any GOVT/PSU/Limited/PVT Ltd organizations. Supporting documents should be submitted. If the supply of Drone order is in progress LOI or WO can be submitted.
- 3.OEM Authorization letter for Type Certified Drone should be submitted

General tender documents and tender schedule can be downloaded in A₄ plain size paper free of cost from the website www.etenders.kerala.gov.in. **Duly filled up and signed tender schedule along with relevant documents should also be sent to**

Director

School of Environmental Sciences

M.G. University,

Kottayam, Kerala Pin-686560, by speed post, so as to reach before the date and time specified.

The cover containing the documents should super scribe the name of the scientific equipment, tender number, and last date of submission of tender.

Documents to be submitted along with bid through online/speed post.

Sl.No	Through online	Through speed post
1	Scanned copy of dealership certificate	Copy of valid dealership certificate
2	Scanned copy of duly filled e-payment form	Duly filled e-payment requisition.
3	Scanned copy of other certificates required, if any, for tender acceptance	Copy of other certificates required, if any, for tender acceptance.
4	Scanned Copy of duly filled preliminary Agreement in stamp paper of Rs.200/-	Preliminary Agreement in original
5	Scanned copy of Compliance Statement	Copy of Compliance Statement
6	BOQ	Not Required

Special Conditions

1. Equipment Storage facilities (if any), electrical power requirements, earthing, room temperature/ humidity requirements etc.should be mentioned appropriately and shall be carried out by the firm itself.
2. All necessary accessories should be supplied with the instrument, as per standard package offered, including complete set of service and operation manuals for diagnosis, trouble shooting, maintenance and electronic circuitry (hard and soft copies).
3. The Delivery Schedule, Payment Terms & Warranty/Guarantee etc must be clearly indicated in the technical bid.
4. **Factory warranty** - at least three years of comprehensive onsite guarantee/warranty must be provided with continued software up-gradation and frequent onsite inspection during the warranty period
5. Two years AMC (optional)
6. Dust cover, all wires, cords, connectors and standard accessories needed for the proper installation and functioning of the equipments
7. Supply the equipments from manufacturer with best compatibility & upgradability
8. Technical features for the product quoted should exclusively be supported by an authentic company catalogue that can be verified from the official company website. The bids not supported with an accurate/original record will not be considered.
9. Bidder should provide a good user list of the quoted model with contact details
10. Should submit a performance report of the quoted model from any central/state government institution

11. Bidder should be a reputed Original Equipment Manufacturer or Authorized dealer of OEM who has an Authorization Certificate from the OEM to participate in the tender. Certificate from the OEM for sales and service to be produced
12. Should have a factory-trained Service Engineer preferably available in Kerala (For the quoted model)
13. The bidder should provide a proper demonstration cum training at their cost for faculties and Students in using the instruments
14. The bidder should ensure the transportation uploading and installation of the instrument at the place in a laboratory suggested by the Director, and any accessory for the same should be managed at their cost.

The bids will be opened at the date and time specified. Further details can be had from **Director School of Environmental Sciences, M.G. University, Kottayam, Kerala Pin-686560** on all working days during working hours. The bidders are advised to submit their bid well in advance to avoid any kind of network issues. If relevant documents through speed post are not submitted with in time, the tenders will not be considered. The tender would be extended for 10 more days if sufficient number of bidders are not available at the time of opening.

The undersigned reserves the right to reject any or all the tender without assigning any reason whatsoever.

**Director
School of Environmental Sciences
M.G. University,
Kottayam, Kerala Pin-686560**