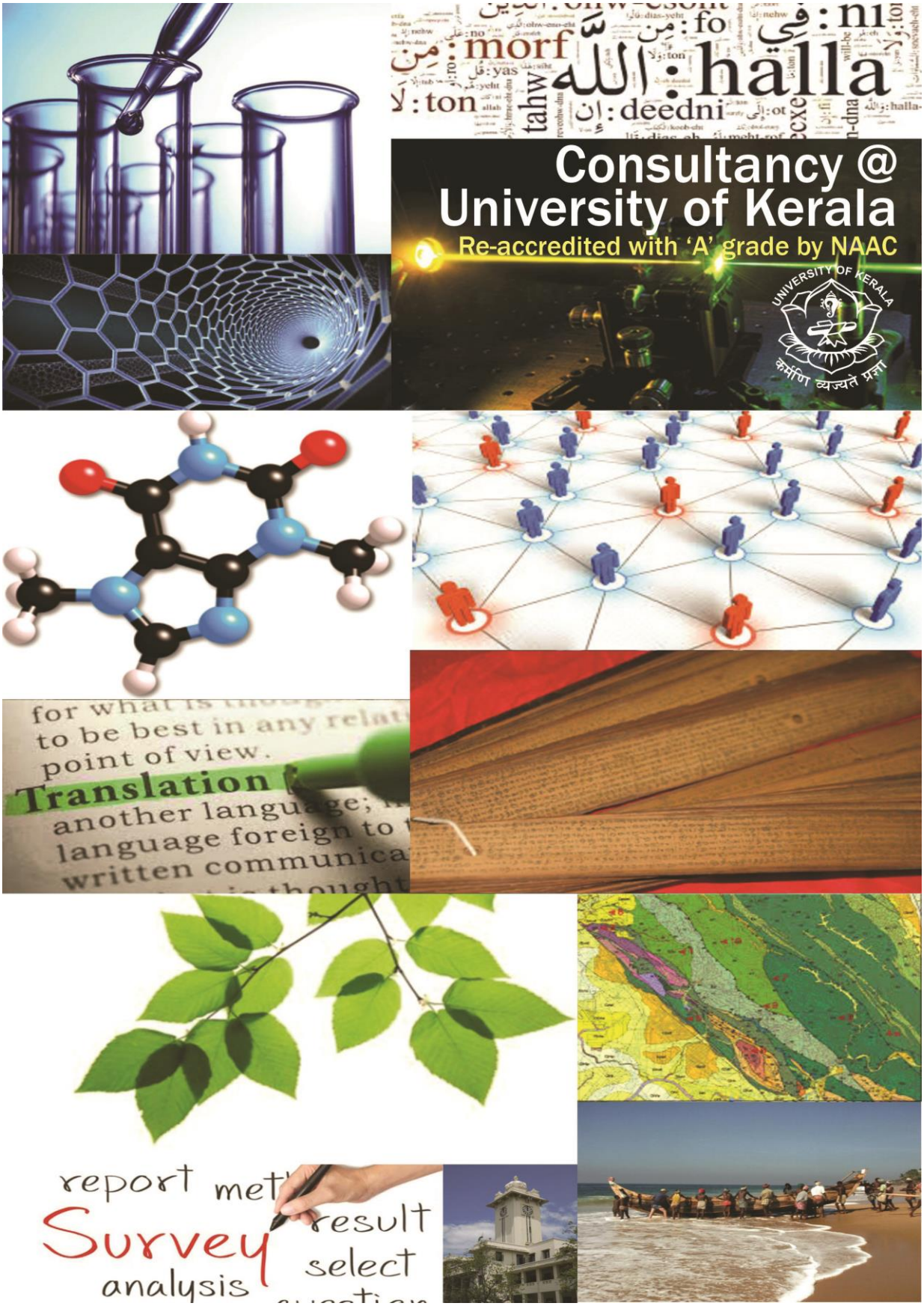
Consultancy @
University of Kerala
Re-accredited with 'A' grade by NAAC
UNIVERSITY OF KERALA
कर्मणि व्यज्यते प्रज्ञा
Translation
report
Survey
result
select
analysis

Consultancy Brochure

University of Kerala

Re-Accredited with 'A' Grade by NAAC

University Consultancy Cell
University of Kerala
2016

University Consultancy Cell

(i) The Vice-Chancellor (Chairman)
(ii) The Pro-Vice-Chancellor
(iii) One Syndicate member nominated by the VC
(iv) The Registrar
(v) The Finance Officer
(vi) The Director (Planning & Development)
(vii) The Director of Research
(viii) The Director of IQAC
(ix) – (xi) Three Heads of the University Teaching Depts, nominated by the VC
(xii) One Senior Professor, nominated by the VC.

CONTACT DETAILS

For all consultancy enquiries, please mail or write to:

Prof Dr Annie Abraham

Director, UCC

Professor & Head, Dept of Bio-chemistry
University of Kerala, Karyavattom Campus
Thiruvananthapuram 695581

Email: annieab2001@gmail.com

Tel (O): 0471-2308078 Mob: 9447246692

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About the University of Kerala and its Consultancy Service Scheme

One of the first 16 Universities in India, the University of Kerala was founded as the University of Travancore in 1937. During the 7 decade since, the University of Kerala grew and shrunk physically and transformed itself in many ways. The earliest origins of the University may be traced back to two institutions of modern learning in Kerala, the University College, Thiruvananthapuram and the Trivandrum Observatory (The Trivandrum Observatory was founded in 1838 and had an internationally reputed scientist, John Caldecott FRS as its first Director - it is now the oldest institution under the Kerala University). In 2015, the University of Kerala was re-accredited with 'A' Grade by National Assessment and Accreditation Council (NAAC).

At present, the University has sixteen faculties (subject groups) and forty one departments of teaching and research in addition to study centres and other Departments. The Departments are:

Science & Technology Departments: Opto-electronics, Computer Science, Computational Biology & Bioinformatics, Futures Studies, Physics, Chemistry, Botany, Zoology, Bio-chemistry, Bio-technology, Aquatic Biology & Fisheries, Environmental Sciences, Geology, Psychology, Mathematics, Statistics, Demography

Social Sciences Departments: Sociology, Political Science, Economics, History, Archaeology, Islamic Studies, Commerce, Managment, Education, Law, Library and Information Sciences, Philosophy

Arts and Humanities Departments: English, Russian, German, Arabic, Malayalam, Hindi, Sanskrit, Tamil, Linguistics, Oriental Research, Communication and Journalism, Music

It has 168 full-time faculty members working in these Departments, most of whom are PhD holders. Technical officers and research fellows are also in service. Teaching, research and knowledge extension are the mandates of the Departments. They primarily focus on post-graduate (masters) programmes, M.Phil programmes (1-year research degree) and doctoral research. The University Departments are mostly situated in the sprawling green campus in Karyavattom, adjacent to Technopark. The University has been publishing the Journal of Indian History, a prominent publication in the area since 1946. The Manuscript Library of the University is a treasure trove of Indian culture. The library has over 65,000 works in 30,000 copies mainly of palm leaf manuscripts, in addition to paper manuscripts, copper plates, birch bark etc. The University Library has a collection of 3.5 lakhs books and the Department libraries another 5 lakhs. The campus is wi-fi enabled. A sophisticated instrumentation and computation centre in addition to a central computing facility serves the whole university research.

All faculty members are encouraged to take up consultancy services individually or as Departmental work. The University has a scheme to enable its special infrastructure and expertise of its faculty and technical staff to offer specialized consultancy services to individuals and organizations. When the consultancy service does not involve use of University facilities, it is considered **as individual consultancy** and otherwise, **institutional consultancy**. A "University consultancy Cell" (UCC) chaired by the Vice-Chancellor processes all consultancy projects and the co-ordinater of the UCC is empowered to receive all approved consultancy funds and provide it to the consultant, cutting the red tape. All consultancy services are charged service tax (presently 15%).

As the University of Kerala is a multidisciplinary University with Depts. specializing in 41 subjects, it is able to offer a wide range of consultancy services, from plant identification to Arabic translation, from software development to social surveys, from medical image analysis to water testing. Recently, the University has set up a sophisticated Instrumentation Faculty enhancing its services further. In addition to professional consultancy, the University Depts. also welcome academic consultancy in the form of student projects etc. subject to its own requirements for serving its full time students.

The University welcomes enquiries for consultancy services.

Recent Consultancy Clients

FHI-UK
Reliance
MGNRGEP
World Bank
Federal Bank
Kannur University
Chibro Aqua, Israel
State Resource Centre
Kerala Water Authority
Microsoft India Pvt. Ltd.
Asian Development Bank
Trivandrum Corporation
Motor Vehicles Department
Biothera Health Care Group
VP Fibro Aquaculture, Israel
Kerala State Planning Board
Election Commission of India
Kerala State Electricity Board
Kerala State Biodiversity Board
Kerala State Revenue Department
Federal Manipal School of Banking
Kerala State Ministry of Agriculture
Gulati Institute of Finance and Taxation
Japan Bank for International Cooperation
Kerala Sustainable Urban Development Project
Centre for the Study of Developing Societies, New Delhi
Israel Agency for Development of Aquaculture in Kerala

Science & Technology

Facilities available at the

Sophisticated Instrumentation & Computation Centre
University of Kerala

1. ATOMIC FORCE MICROSCOPE [Bruker- Dimension Edge with ScanAsyst]: The Dimension Edge Atomic Force Microscope (AFM) incorporates Peak Force Tapping technology to provide the highest level of performance in its class, to deliver the low drift and low noise data. Dimension Edge utilizes ScanAsyst, an automatic image optimization technology for atomic force microscopy. The ScanAsyst imaging, integrated visual feedback, and preconfigured settings enable expert-level results easily and consistently. The system is incorporated with a high-resolution 5 MP camera with motorized focus and integrated stage control to provide fast sample navigation. It has an X-Y Scan range of 100 µm x 100 µm. This unit is provided with standard AFM modes such as Contact Mode, Tapping Mode, Lift Mode, Magnetic Force Microscopy, ScanAsyst etc, and optional modes such as Scanning Tunneling Microscopy and Conductive AFM. It includes the three-axis closed loop control for point-and-shoot positioning and ramping. The raw data is captured by the independent Nano Drive software and the images are post processed using NanoScope Analysis software package.

2. ICP-MS (Thermo scientific ICAP QC): The iCAP QC offers uniquely reliable cell mode performance and is configured for highquality analyses in routine, high-throughput laboratories, such as those specializing in environmental analysis, food quality control and geochemical exploration. With self-aligning injector, cone and lens assemblies, unparalleled plasma and collision cell stability and improved resistance to heavy sample matrices, the iCAP Q requires less maintenance and delivers accurate results even in challenging and complicated sample conditions. The iCAP Q is the only ICP-MS system to include proprietary QCell technology combining proven He KED (kinetic energy discrimination) interference reduction capabilities with a flatapole low mass cut-off. In comparison with higher-order multipole systems used in collision cells, the flatapoles in the QCell provide a low mass cut off that stops unwanted species from passing to the quadrupole mass filter. This provides complete collision cell reliability, even with new, complicated sample matrices. Elements like As and Hg can be analysed in ICAP Q c without hydride ion generator. ICAP Q C requires complete dissolution of the sample before it is analysed. Our lab is equipped with Anton parr multiwave 3000 Microwave digester for sample dissolution. How should the sample be supplied? Rock and soil samples should be provided in solution form, using any suitable dissolution procedure. The acids used and the procedure adopted should be informed with the dilution factor. Only suprapur grade acids should be used for sample preparation. Other nonrefractory samples including biological samples can be provided in powdered form, liquid form or paste form along with sample weight and dissolution procedure adopted

3. X-ray Diffractometer (Bruker D8 Advance): X-ray diffractometer (Bruker D8), possess innovative design namely DAVICNI, which combines operating safety, ease of use and user safety. It can be operated in both Powder X-ray Diffraction (PXRD) and Grazing Incidence X-ray Diffraction (GIXRD) modes. The hardware, electronics and software ensure easy adaption in the field of X-ray powder diffraction as well asGI XRD. Hence it is one of the best diffractometers available around the world.X-ray powder diffraction can be used for crystallographic investigations of powdered samples. Search match facility is also available. GIXRD facility is a sophisticated tool for crystallographic investigation of samples in thin film

forms. The Rietveld refinement software Topas and XRD pattern matching software EVA were installed.

4. Leica TCS SP8 Laser Scanning Spectral Confocal Microscope: The Leica TCS SP8 Laser Scanning Spectral Confocal Microscope with the synergies of multiband spectral detector, acousto-optical beam splitter (AOBS) and supersensitive Leica HyD, provide maximum photon efficiency and gapless spectral detection. This superior sensitivity directly translate into reduced laser power for cell viability and resolution. The AOBS (Acousto-Optical Beam Splitter) is a completely transparent, active TeO2 crystal, which offers maximum photon efficiency. An acoustic wave coupled into the crystal changes its transmission properties. It switches within microseconds by simply changing the radio frequency of the wave. The AOBS can accommodate up to eight reflection bands. Confocal microscopes revolutionalized our view of cells and became a major instrument in unraveling the complexities of the morphology and dynamics of cells and tissues. Initially it was used to observe the general spatial distribution of usually one or two fluorescently labeled structure or cell population in living or fixed samples. Now researchers can distinguish between two closely spaced structures within a specific organelle such as visualizing RNA polymerase II mediated transcription sites associated with speckles in the nucleus. High resolution confocal microscopy has been used during in situ hybridization to localize specific gene sequences to specific chromosomes. It can be used to visualize cellular localization of ions, macromolecules such as RNA, DNA and proteins, cytoskeleton elements, and cell organelles.

5. Campus Computing Facility

The Campus Computing Facility is a dedicated Central Computing Facility under the DST Purse Programme, which enables faculty and students to use computational methods in their research. The Linux cluster at CCF is dedicated for the researchers to enable the next generation of computational scientists to make full use of this important technology. For easy access and better utilization of these facilities, a series of training programmes and workshop are conducted on various aspects of scientific computing. CCF has 50 Desktop computers and a High performance computing cluster which has has 10 nodes: - a master node with 24GB of RAM and nine compute nodes with 8 GB RAM each. Each node is a dual six-core Intel®XeonE5645 series 2.40GHz rack server. The softwares installed in CCF for the utilization of researchers and faculties are as follows:

Chemistry related softwares

- Turbomole 6.4 for quantum chemical application
- NWChem 6.0 ab initio computational chemistry software
- Tinker 6.1 molecular modeling package (molecular mechanics and dynamics)
- GROMACS (GROningen MAchine for Chemical Simulations) molecular dynamics package for simulations of proteins, lipids and nucleic acids.
- VMD

Bio-informatics applications

- HMMER
- NCBI BLAST, MpiBLAST
- Biopython
- ClustalW
- MrBayes
- T_Coffee
- Emboss

- Phylip
- Fasta
- Glimmer
- perl-bioperl

Parallel computing MPI libraries

- OpenMPI; MPICH

Compilers

- C/ C++
- FORTRAN
- Perl
- Python 2.7 and ipython 0.10 interactive shell for python programming

Statistical Analysis

- IBM SPSS 20
- pspp 0.6.2

Remote Access and Virtual Desktop

- FreeNx for ssh based remote login
- OpenSSH

Statistical computing and Graphics

- R 2.15.2 for Statistical computing and Graphics
- Gnuplot 4.2.6 for 2D and 3D plots
- python–matplotlib 0.99 2D plotting library

Mathematical and Numerical Computation

- Blas 3.2 ,Atlas 3.8, GotoBlas2 ,Openblas linear algebra library
- Scilab 5.4.0 for numerical computation
- scipy 0.7.2 and numpy 1.4.1 mathematical and scientific computing library
- Matlab2012

Job Queueing system

- SGE 6.2 Sun Grid Engine (Open Grid Scheduler)
- Condor High Throughput Computing environment

Cluster monitoring system

- Ganglia

Web server

- Apache

Computing Facilities extented currently:

(i) Computational Chemistry: HPC facility is used mainly to run job using NWChem program. It has been used in connection with certain projects that have got biochemical significance. Density functional theory calculations were employed to quantify the effect of hydrogen bonding interactions in the nucleophilic exchange reactions involving cystines and selenocystines.

(ii) Membrane dynamics: Modelling biological system behaviour is a significant task of systems biology and mathematical biology. Computing systems biology, aims to develop and use efficient algorithms, data structures, visualization and communication tools with the goal of computer modelling of biological systems. Currently the dynamical and configurational properties of lipid bilayer membrane is analysed computingly using molecular dynamics (MD) simulations which computingly prohibitive to carry out its long term behaviour.

(iii) Social Network Analysis: Social network analysis [SNA] is the mapping and measuring of relationships and flows between people, groups, organizations, computers, URLs, and other connected informa tion/knowledge entities. The nodes in the network are the

people and groups while the links show relationships or flows between the nodes. SNA provides both a visual and a mathematical analysis of human relationships. Management consultants use this methodology with their business clients and call it Organizational Network Analysis [ONA]. Some of the researchers here are utilizing the computing facilities of the centre to study Indian Railway network, Citation networks, road network etc.

(iv) Opinion mining and sentimental analysis: Opinion mining or sentimental analysis often refers to process of deriving subjective information such as sentiments of the writer from written material using computing tools using natural language processing etc. This has become increasingly relevant in the current scenario where users of product write their opinion about product on online forums such as twitter which is very large in size so that one cannot go and read everything. Currently CCF is providing computing assistance to a study to develop sentimental analysis tools to analysis large volume of twitter data on specific commercial product.

(v) Wind modeling and forecasting: Surface wind plays a crucial role in the climate and the weather system of the earth. Wind speed modelling and forecasting is an important aspect of wind power generation – yet one of the most difficult due to the myriad factors affecting it and over the years many tools have been developed for this purpose. One the research group here is trying understand better the underlying dynamics wind speed fluctuations and develop better computing tools capable of predicting accurate short term behaviour.

(vi) Bio-informatics: Clusters could potentially be useful for deriving desired information from the raw data, as well as to use algorithms interpreting huge data, within a short time span. The cluster computing facility at CCF has been used for bio-sequence compression based on a parallel pattern recognition. The sequence alignment research works needs to handle large sequence of data (30GB).

Pls see Appendix for rates and forms to request use of sophisticated instrumentation facility

1. Department of Futures Studies

The department was established by the UGC and the Department of Science and Technology (Govt. of India) in the academic year 1990-91. The Department is offering interdisciplinary M. Phil. in Futures Studies, M. Tech. (Technology Management), UGC innovative programme Post Graduate Diploma in Knowledge Management apart from Ph. D. programme. Consultancy Group for Research and Forecasting (C-Graf) has been formulated as a consultancy centre of the Department. C-Graf has successfully completed lot of interdisciplinary projects for various funding agencies like World Bank, ADB, JBIC, FHI-UK apart from other state and central government bodies.

Consultancy Areas:

- Large scale social surveys
- Medical and health surveys
- Environmental impact studies
- Large scale cadastral mapping exercises
- Resource mapping
- Digital image processing using specialised softwares
- Geographic Information Systems (GIS)
- Global Positioning Systems (GPS)
- Database Management
- Data modelling
- Big data analytics
- Simulation and Modelling
- Optimisation
- Large Scale networks
- Psephological studies

2. Department of Computer Science

The Department of Computer Science was established in 1985 and has generated a strong post graduate culture in Computer Science studies. The Department is running two teaching programmes–M.Sc Computer Science and AICTE approved M.Tech with specialization in Digital Image Computing. The Research programmes of the Department have borne fruit through 28 Ph.Ds produced by it. In recognition of its efforts in research activities, the Department of Science & Technology (DST), Government of India, supported the Department through the FIST programme grant of Rs. 50 lakhs.

Consultancy Areas:

- Medical Image Analysis
- Software Development and Automation
- Cyber Forensics
- Satellite Image Analysis
- Database Optimization
- Text Analytics
- Data Mining and Analytics
- Design and development of mobile applications
- Software solutions for embedded systems
- Computer Vision

3. University Computer Centre

University Computer Centre over the years has served as a hub for IT related services on the campus. The Centre has a significant role in software development for the University and other organisations. IT related projects include software, hardware, networking, digitization, archiving, web enabling, data integration, data mining, e-governance and e-learning.

Consultancy Areas:

- **Hardware support and AMC:** University computer centre provides support for all hardware related activities such as designing, procuring, installing, interfacing, troubleshooting and maintaining of IT devices and peripherals. Computer centre is providing design and implementation of high Performance computing to organisations. Rajiv Gandhi Centre for Biotechnology was one of the clients.
- **IT Infrastructure support:** We are providing IT infrastructure support to the University and other organisations. Last year we provided Network Security services to the Rajiv Gandhi Centre for Biotechnology. We can provide design and implementation of Data centre solutions.
- **IT Solutions:** Provide complete, latest and cost-effective solution to all IT enabled activities in the University. The solution includes the complete software project management process from requirement analysis to implementation and maintenance. Computer centre provide support for open source technologies and implementations and to encourage their use in the University activities.
- **IT training:** Conduct training programmes in the field of IT usage, IT management, and e-governance activities. Offering students projects to the affiliated colleges in masters level.
- **Software Development:** To develop, configure and implement necessary software for different office and examination activities with a view to improve productivity, reduce expenses, increase transparency and extend anywhere and anytime working. To provide complete web services, support for online activities, site hosting, online learning, and online examinations.
- **Online services:** Computer centre offers online services to the University and other organisations. For the last year we have conducted online admissions for Kannur University.

4. Department of Statistics

The Department of Statistics, University of Kerala is the second oldest University teaching department in India and is committed to advancing knowledge and learning through teaching and research in Statistics. The Department offers M.Sc. and M.Phil degree programmes in Statistics, as well as research leading to Ph.D. degree in Statistics. All teachers of this department offer Statistical Consultancy Service which provides general advice on the application of statistical methods. This department offers Statistical Consultancy to the academic as well as industrial community in and around Trivandrum.

Consultancy Areas:

- Agricultural Statistics
- Biostatistics
- Exploratory Data Analysis
- Marketing Research
- Multivariate Techniques
- Reliability
- Sampling Techniques
- Stochastic Modeling and Time series

5. Department of Optoelectronics

Department of Optoelectronics was established in 1995 to promote studies in Photonics, Optoelectronics and Laser Technology and it is under the Faculty of Applied Science and Technology of University of Kerala. The Department offers M. Tech Degree programme in Electronics and Communication (Optoelectronics and Optical Communication), M. Phil programme in Photonics and Ph.D programs in different areas of Photonics.

Instrumentation facilities available: Field Emission Scanning Electron Microscope with EDX facility, Micro Raman Spectrometer (with excitation wavelength of 514nm and 785nm available), UV Visible Spectrophotometer. FTIR Spectrometer, Spectrofluorometer, Impedance analyzer (Gold electrode to be provide by the user).

Consultancy Areas:

- Thin film preparation (of desired size, thickness and composition) using RF Magnetron Sputtering and Pulse Laser ablation using Nd-Yag Laser.
- Gold nano particles of different shapes and size.
- Laser technology
- Holography
- Transparent conducting electrodes
- Security holography
- Substrates for Surface Enhanced Raman Spectroscopy
- Nanophosphors
- Synthesis and characterization of Nanocomposites

6. Dept. of Computational Biology & Bioinformatics

Department of Computation Biology &Bioinformatics, established originally as Centre for Bioinformatics in 2005, is an inter-disciplinary Department with a community of researchers, teachers, and students from a variety of backgrounds including computer science, engineering, mathematics, molecular biology, chemistry, bio-technology etc. Within the short span of existence, the Department has made modest and steady progress in teaching, research, scholarly publishing and contribution to international bio-databases and development of software tools in bioinformatics. Facilities include Informatics Lab, Drug discovery Lab, Basic Molecular Biology lab and Bio-electronics Lab. Recent consultancy clients for the department include: MicrosoftIndia Pvt. Ltd, Biothera Health Care Group and Kerala State Biodiversity Board. The Department has M.O.Us with C-DAC, SciGenom Pvt. Ltd. and Govt. Ayurveda College, Trivandrum.

Consultancy Areas:

Technical:

- Developing Soft Computing tools for Bio-sequence Analysis
- Big Data analytics
- NGS data analysis
- Phylogenetic analysis
- Molecular Modeling
- Computational Drug Design
- Cytotoxicity testing using in-vitro cell culture
- PCR & Primer designing
- Molecular cloning
- Blotting techniques

Pedagogic:

- Pedagogy workshops including Research Methodology and "Learning to Learn"
- Preparation of Research/Funding proposals
- Organizing workshops on NGS, Perl, Phython, R and Big data Analysis, Scilab and Bioinformatics tools.

7. Department of Physics

Department of Physics was established in the year 1970. Academic programs in the Department include M.Sc. Physics (with specialization in Applied Electronics), M.Phil Physics and Ph.D program. Main areas of research include Nanostructured Materials, Microwave Dielectric Materials, Materials for Electromagnetic Shielding, and Materials for Fuel Cell Electrolytes and Electrodes.

Instrumentation Facility Available in the Department

- Photoluminescence spectrophotometer
- UV-Visible spectrophotometer
- Network Analyzer
- Source Meter
- Electrometer
- Electrical Conductivity Measurement in Vacuum and Desired Atmosphere
- High temperature Sample holder for Impedance Measurement
- Electrochemical Workstation
- Muffle furnaces
- Hot air Ovens and Microwave Oven
- Z-scan setup

Consultancy Areas:

- Nanostructured transition metal oxide based supercapacitors
- Development of nanostructured transition metal oxides with engineered electrical properties
- Development of materials for dielectric resonators
- High K dielectric materials
- Materials for Electromagnetic Shielding Applications
- Materials for Fuel Cell Electrolytes
- Materials for Fuel Cell Electrodes
- X-ray Diffraction Analysis of Materials
- Inorganic oxide based phosphors

8. Department of Chemistry

The Department was established in 1937 and offers M.Sc., M.Phil. and Ph.D programmes. The Department focuses research on the following areas: Removal of environmental pollutants from water resources; Development of Nano materials for medical applications; Development of Nano material coating for medical applications; Development of functional micro porous polymers; Development of functional nano materials; Computational Chemistry; Synthetic organic chemistry; Hydrogen energy; Sacrificial anode; Hot dip coating and Industrial metal finishing. The Department has many patents and very recently it has filed two patents one on 'development of orthodontic coating for medical application' and the other on 'development of functional polymers'. The Department plans to file two more patents soon, one on 'development of sacrificial anode' and the other on 'development of composite hit dip galvanic coating for protection of steel'.

Consultancy Areas:

- Development of hot dip galvanic coating for protection of steel
- Development of sacrificial anodes for protection of steel
- Development of industrial hard metal coating,
- Hard-soft metallic coating for specific applications (e.g. for air craft landing gear)
- Development of catalytic electrodes as sensors or for electrochemical reactors
- Development of electrochemical hydrogen generator
- Development of suitable orthopaedic / orthodontic coating
- Development of light metal alloys for corrosion tolerance
- Testing of hydrogen
- Testing of by AAS, HPLC, IR, UV, Spectro fluorometer, DLS
- Support for spectral data analysis for organic structure elucidation
- Support for 'computational chemistry' / 'molecular orbital theory calculations'.

9. Department of Biochemistry

The Department of Biochemistry was established in 1970 and offers MSc Biochemistry, MPhil Biochemistry, MPhil Genetics and Genomics and PhD programmes. Thrust areas of research include atherosclerosis, diabetes, cell biology, nanobiology, structural biology, inflammation, arthritis, cancer research, epigenetics and tissue engineering. The department has generated lot of funds during the period 2008-2015 with an external funding of 3.81crores and university funding of 1.85 crores. The department was funded by UGC-SAP DRS Phase II Programme of 72 lakhs and DST-FIST Programme of 62 lakhs. Other ongoing projects include BSR-Start up grants and major projects funded by UGC, DST, KSCSTE etc. The department has produced more than 250 PhD's with more than 800 publications in international, indexed journals. The average impact factor for publications during the period, 2008-2014 is 2.6.

Consultancy Areas: Screening of hepatitis/rheumatoid arthritis/lifestyle diseases etc.

- Healthy diet formulation.
- Nutritional supplements in health and disease.
- Antioxidant and anti-inflammatory screening
- LOX, COX, lipid mediators, cytokines by ELISA
- Rheumatoid Arthritis Factor (RAF)
- C - Reactive Protein (CRP)
- Cyclic Citrullinated Peptide Antibody (CCP)
- Lipid Profile (Total cholesterol, HDL, LDL,VLDL cholesterol and Triglycerides)
- Blood Glucose (Fasting, Post prandial, Random)
- Glycated hemoglobin (HbA1C)
- Blood grouping (ABO grouping)
- Hepatitis B Screening
- Biochemical testing- for metabolic disorders and lifestyle diseases.
- Evaluation of anti-microbial agents
  Training for undergraduate, postgraduate students and research scholars
- Molecular Biology techniques
- Cell Culture Techniques
- Microbiology Techniques

10. Department of Botany

Department of Botany, University of Kerala, was established in the year 1959 by Late Prof. (Dr.) A. Abraham. The Department actively serves the society through dissemination of knowledge and training the younger generation through unique courses and offering training in frontier areas of Plant Sciences. The Department is internationally known for its major contributions in cytogenetics and Cytotaxonomy and for running a novel postgraduate programme on Genetics and Plant Breeding. The Department is also active in research in the areas of plant cell/tissue culture, Molecular biology, Phytochemistry, Plant Systematics, Plant reproductive biology and Biodiversity conservation.

Consultancy Areas:

- Identification of plants and certification
- Setting up tissue culture laboratory and propagation of banana, medicinal herbs, ornamentals such as orchids, carnations etc.
- Short term training on plant tissue culture
- Cell culture based metabolite production such as anthraquinones and saponins
- Herbal extraction process- natural dyes, essential oils, saponins and alkaloids
- Phytochemical analysis – qualitative and quantitative methods
- Antimicrobial, antioxidant activity tests for herbal extracts
- Nitrogen, protein analysis- plant, animal, drug samples based on Dumas' method
- Image analysis, microphotometry, digital microscopic imaging, phase-contrast microscopy
- Setting up small gardens for offices and houses, landscaping
- Fresh and dry flower arrangement: short term training and supply as per the order
- Training on nursery practices and consultancy on maintenance of home gardens
- Training and consultancy on seed collection, storage, viability tests, germination, handling recalcitrant seeds, traditional seed storage practices, and embryo rescue techniques
- Artificial pollination and hybridization techniques
- Graduate, post graduate level projects on following disciplines; plant tissue culture, genetic diversity analysis, phytochemical profiling, seed science, reproductive biology
- Training in plant vegetative propagation methods.

11. Department of Zoology

The University Department of Zoology was established as a full-fledged teaching and research department in July, 1968, at Kariavattom and the main areas of research are: - Insect Physiology, Endocrinology, Muscle Physiology, Wild Life Biology, Animal Physiology, Animal Behaviour, Vector Biology, Environmental Biology, Stress Physiology, Fish Biology, Aquatic ecology and Natural products. Active research in these areas is in progress with substantial financial aid from national funding agencies. Adequate facilities are available for the research in mentioned areas.

Consultancy Areas:

- Aquaculture
- Biodiversity assessment part of the Environment Impact Assessment
- Bio-monitoring of Wetlands
- Survey of birds, butterflies etc.
- High-throughput screening of hair, skin and cancer molecules and crude extracts (animals and plants)
- Hair and skin products validation using 3D cell culture
- Evaluation of Ayurvedic formulations (Hair and Skin)
- Tissue Culture (Stem cells, Primary Cells, Keratinocytes, Splenocytes, T cells etc.)
- Toxicity studies
- Omics, NGS data analysis and Interpretation
- Validation and confirming transcriptome, protein and metabolomics
- Microscopic techniques (Fluorescent, Confocal, TEM, SEM and Photon Excitation Microscopy)
- Genomics, Proteomics and Metabolomics Studies and Techniques
- Retrovirus Preparation and Transduction Pedagogic Sevices
- Virtual learning Platforms
- E learning solutions
- Curriculum in design and development

12. Department of Aquatic Biology & Fisheries

One of the oldest teaching-cum-research Departments of the University of Kerala and Centre of Advanced Study of University Grants Commission, India, Dept. of Aquatic Biology & Fisheries has completed 75 years of its existence in 2013. This Department has a Centre for Aquaculture Research and Extension (CARE) and has expertise in the topics of Aquatic Ecology, Restoration Ecology, Taxonomy, DNA barcoding, Biodiversity Conservation and Documentation, Fresh and Brackish water Aquaculture, Management of Home and Public Aquariums, Ornamental Fish Culture and Breeding, Seed Production Shrimps and Ornamental Fish, Fisheries Extension, Fish Pathology and Aquatic Pollution and Toxicology, and played a major role in human resource development in the fields of Aquatic Biology and Fisheries.

Consultancy/training offered:

- Freshwater and Brackish water Aquaculture: Training and Consultancy
- Seed production of shrimps and fish: Training and Consultancy
- Ornamental fish breeding, Aquarium Keeping and Maintenance: Training and Consultancy
- Public Aquarium: Training and Consultancy
- Aquatic Taxonomy: Taxonomic identification and DNA barcoding of aquatic organisms with special reference to Crustacea, Mollusca, Echinodermata, Fish, Pelagic Birds, Reptiles and Marine Mammals: Training and Consultancy.
- Water Quality Monitoring of inland water bodies: Consultancy
- Fish Census in inland water bodies: Training and Consultancy
- Environmental Impact Assessment: Inland Aquatic Ecosystems: Consultancy
- Policy documents on conservation and biodiversity: Consultancy

13. Department of Environmental Sciences

The Department of Environmental Sciences was started in 1995 by University of Kerala as a teaching and research department. Analytical studies in research pertaining to different aspects of Environmental Sciences have been carried out by the Department. Water Testing Laboratory with approved license by the Kerala State Pollution Control Board was established in the Department on February 17th, 2014. **Special Instrument Facility:** BOD Incubator, Flame Photometer, High Performance, Liquid Chromatography (HPLC).

Consultancy Areas:

- Water testing facility is available for public and private sectors.
- Analyse the important physical, chemical and bacteriological parameters in well/drinking water samples.
- Payment for testing each water quality parameter, and the rates are approved by Kerala State Pollution Control Board.

Analysis charge for water samples

Sl. No.	Parameters	Analysis Charge Per Test (Rs)
I. Physical		
1	Total Hardness	100
2	Calcium Harness	100
3	Acidity	100
4	Alkalinity	100
5	Electrical Conductivity	60
6	Turbidity	60
7	Total Solids DS	100
8	Suspended Solids	100
9	Volatile Solids	150
II. Metals		
1	Calcium	100
2	Sodium	150
3	Potassium	150
III. Inorganic Non-metallic Constituents		
1	Chlorides	100
2	pH value	60
3	Nitrite Nitrogen	200
4	Nitrite Nitrogen	200
5	Ammonical Nitrogen	200
6	Dissolved Oxygen	100
7	Total Phosphate	350
8	Sulphate	150
IV. Aggregate Organic Constituents		
1	Biochemical Oxygen Demand	600
2	Chemical Oxygen Demand	350
V. Micro Biological Parameters		
1	Standard Plate Count	200
2	Total Coliforms (MPN method)	350
3	Fecal Coliforms (MPN method)	350

14. Department of Geology

The Dept. of Geology has eight faculty members (including two UGC recharge faculty) and one Emeritus fellow. The specializations range from pure geology to applied geology to environmental sciences and climate change. **Analytical capabilities:** Resistivity Meter, Infiltrometer, • Remote sensing data products, Proprietary and FOSS GIS labs; • Atomic Absorption Spectrometer (AAS) for elemental analyses of various media. • UV VIS spectrometer; • Fume hood with HF – HNO3 based digestion and solution preparation of rocks, minerals and refractories – well equipped chemical lab to analyze rock and water samples – material characterisation.

- Water resource management, locating bore wells and dug wells
- Preparation of water budget plan and consultancy for rainwater harvesting.
- Resistivity survey for identification of sub surface lithology and fractures
- Preparation of village wise water security plan and solving drinking water problem
- EIA studies for developmental projects
- Water conservation and artificial recharging of groundwater resources
- Carbon sequestration - Simulation of carbon and water cycles using numerical models, use of remote sensing, measurements of carbon, water and energy fluxes using micrometeorological techniques. Various aspects of climate change issues.
- Regional hydrology-Simulation of water cycle using distributed ecohydrological models, measurement of hydrological fluxes
- Remote sensing- physics and application of remote sensing to retrieve land surface biophysical parameters in the optical, thermal and microwave domains.
- GIS- Development of Decision Support systems for socioeconomic, academic and industrial applications
- Modeling Platform development – Development of modeling platforms and GUIs for various academic and industrial applications.
- GIS- For socioeconomic, academic and industrial applications
- Soil Quality Assessment: for agricultural, urban and environmental sensitive areas.
- Satellite image interpretation
- Dam break analysis
- Mineral and rock identification, geological mapping and training for geological mapping, geochemical studies
- Training in Free and Open Source Software including GIS, statistical analyses
- Copyediting and typesetting for professional industry-standard publication of books and journals, in LATEX
- Geological mapping, reserve estimation of ores
- Training in Disaster Management approaches & practices (in association with CHAERT)
- REE analyses using the ICPMS and Isotope dating using the LAICPMS (at SICC)

15. Department of Biotechnology

The University Department of Biotechnology was established in 1995. It offers postgraduate Degree and Doctoral Degree in Biotechnology. The department is engaged on both basic and applied aspects of Biotechnology Research. The Department has established and Inter University Centre for Genomics and Gene Technology, an initiative of the Department of Higher Education, Govt. of Kerala. We impart training on various fields of Biotechnology to the needy person according to their research and academic needs.

Major Facilities available: Animal Cell Culture Facility- Carbon Dioxide Incubator, Inverted Microscope, Inverted Fluorescent Microscope Fermenter.; Molecular Biology/ Biochemistry- Microbiology: Refrigerated centrifuges, Refrigerated Micro centrifuge,Protein Gel Electrophoresis,Iso-electric Focusing (IEF),2D Gel Electrophoresis, DNA Electrophoresis, Gel documentation system, Liquid Chromatography with fraction collector, Fast Performance Liquid Chromatography, Laboratory Fermenter/Bioreactor, ELISA Reader, UV-Vis Spectrophotometer, SpeedVac Concentrator, Cryocan for Liquid Nitrogen , HPLC for purification of organic compounds, PCR and RT PCR, Facility for large scale cultivation of animal cell cultures.

Consultancy Areas:

- Microbial analysis of drinking water and Food materials: Microbial quality analysis of drinking water and food materials. Also we conduct short term training in microbial analysis as well as in other related biotechnological and biochemical techniques
- Screening and Evaluation of Bioactivity of synthetic chemicals and natural compounds.
- Animal cell culture based screening and evaluation of synthetic and natural compounds will carried out on request or based collaborative or mutual understanding
- Short term training on Molecular, immunological, animal Cell culture and Microbial techniques.
- The department also undertakes project training of students – PG, M. Phil and PhD students from other departments, colleges and Institutes.

Social Sciences

1. Department of Demography

The Department of Demography was started in the year 1979 and is currently offering MSc and MPhil courses in Demography and Actuarial Science and PhD programme in demography. The department has taken up various research projects on a variety of topics including Demography, public health, reproductive and child health, population ageing, migration, etc. The Department also has been taking up consultancy services from various sources. 'Workstation for Research on Microdata from Census', set up at the Department of Demography with support from Registrar General and Census Commissioner, Government of India, has all the data pertaining to Census of India since 1961.

Consultancy Areas:

- Data analysis of Census Data
- Demography and population issues
- Survey design, planning and implementation
- Monitoring and evaluation of health and social sector programmes
- Reproductive and child health issues
- Migration and its impact on society
- Data collection through interviewing individuals and functionaries
- Data processing
- Data analysis using advanced statistical tools
- Data analysis using SPSS, STATA and other software packages
- Data analysis and report preparation
- Training on various topics including population issues, research methods, ethics in research, scientific writing, data sources

2. Department of Archaeology

The Department of Archaeology was established in 1997 with an intention to offer post-graduate teaching and research facilities in Archaeology. It was formally inaugurated in 1998 as part of the Diamond Jubilee Year Celebrations of the University of Kerala by the then Hon. Minister for Food and Tourism and Law, Government of Kerala Shri. E. Chandrasekharan Nair with then Vice-Chancellor Dr. N. Babu presiding over the function. The Department headed by Dr. Rajesh S.V., offers M.A., M. Phil, Ph. D and Post-Doctoral programmes. The Department's impetus is towards field oriented research study. The initial attempts in this direction have brought out fascinating results which were published in research journals and reported in national and vernacular newspapers. The Department publishes an annual peer reviewed international journal entitled 'Heritage: Journal of Multidisciplinary Studies in Archaeology'. The Department proposes to set up a full-fledged archaeological museum based on the field collections from various parts of India.

Consultancy Areas:

- Buddhist Art and Architecture
- Rock Art Studies
- Heritage Management
- Documentation of Cultural Heritage
- Maritime Archaeology
- Megalithic Archaeology
- Archaeology of Death and Burials
- Early Historic and Medieval Archaeology
- Field Archaeology
- Harappan Archaeology
- Kerala Archaeology
- Typological Analysis of Ceramics and other Artefacts
- Archaeozoology
- Ichthyo-archaeology
- Spatial Analysis using Total Station, GPS and GIS Software
- Ethnography
- Artefact Drawing
- Ethno-archaeology

3. Department of Library and Information Science

The Department of Library and Information Science was established in 1961. It offers Master's Degree in Library and Information Science, M. Phil and Ph.D. The Department provides learning opportunities in Library and Information Science. It undertakes research projects and continuing education programmes in Library and Information Science. Cent percent of our students are getting employment in various library, information centres and information and communication technology related firms.

Consultancy Areas:

- Indexing work
- Web archiving
- Library automation
- Abstracting Services
- Digital Reference Service
- Current Awareness Service
- Compiling bibliographies
- Binding services
- Digitizing the collection
- Retrospective conversion of library records
- Retrospective Cataloguing
- Database design and compilation
- Creation of library websites
- Helping in library stock verification work
- Helping libraries develop specialized services
- Helping in the starting of new libraries including equipment etc.
- Compilation of Union catalogue
- Newspaper cutting and filing services
- Helping libraries to develop special storage strategies
- All Information & Communication Technology Business
- Design and implementation of Information systems and networks
- Providing training and manpower development for the organization

4. Department of Commerce

Established in the year 1985, the Department of Commerce offers M Com, M Phil and doctoral programs. Teaching with a focus on application and practice, supporting policy decisions with academic and research inputs, guiding learners in their career pursuits and fostering Industry -Institute Linkage through academic and co-curricular activities have always been the unique features of this Department with four Professors and 31 full time research scholars.

Consultancy Areas:

- Training and Development- Off the Job and Orientation
- Self-Management
- Formulation of Master Learning Program for employees
- Support for Selection of Employees-Testing and Inducting
- Project Appraisal
- Utilization and Access of credit- regional and Sectoral
- Manpower Planning
- Financial Planning
- Financial Literacy and Inclusion
- Rural credit requirements
- Financial Services utilization- NBFCs, Capital Market, Mutual Funds , Banks , Depository Participants
- Rural credit and Empowerment -SHGs and Micro finance
- Market Surveys and Demand Assessment
- Sales Forecasting
- Effectiveness of Promotional Strategies
- Career Guidance and Counseling for Business Education
- Labour Welfare Assessment
- Social Audit and Performance Evaluation
- Financial Statement Analysis and Interpretation
- SWOT Analysis for Organization
- Case Studies for :Banks, NBFCs, Co-operatives, NGOs, Trade Unions , Non Profit Organizations
- Case Writing and Content Development in the areas of Finance, HRM, Marketing, banking , Rural Development, Entrepreneurship
- Women empowerment and competence Building
- Tourism and Tribal tourism
- Preparation of Detailed Project Reports
- Monitoring of Project Implementation
- Finance and Marketing Inputs to Ongoing Projects
- Local Self Governance Issues
- Waste Management of Corporations and Municipalities
- Government accounting- Convergence Issues

5. Department of Economics

The Department of Economics, University of Kerala is one of the leading centres for teaching and research in the field of economics. It has achieved spectacular track records in teaching and research and is privileged to have groomed so many talented students who continue to bring honour to this institution. Faculty members provide consultancy services to various institutions including State Planning Board, Ministry of Agriculture, Gulati Institute of Finance and Taxation etc.

Consultancy Areas:

- Economics of Education in India and Kerala including programs and policies, Costs and Finances, Expansion, Efficiency and Equity, inclusive Growth, Educational Exclusion and Role of Subsidies and FDI in Higher Education
- Tribal Economics, Poverty Analysis
- Health Economics, Data Analysis
- Environmental Economics, Development Economics
- Law and Economics, Institutional Economics

6. Department of Sociology

The Department of Sociology, established in 1969, offers two post graduate courses (MA Sociology and MSW), M.Phil Course, Doctoral and Post-Doctoral Research. The Department also is offering two certificate courses through School of Distance Education, University of Kerala viz. *Techniques and Methods of Family and Marriage Counseling & Geriatric Care and Management*. The Department has four permanent faculty members, four Contract lecturers and two guest faculty members. We have 23 research scholars including 3 International students from different countries like Ethiopia, South Sudan and Iran. The Department has been providing consultancy services to various government and public sector organizations like: Project on Inter State Migration in Kerala in association with **GIFT;** Project on Social Audit for Rural Development in association with **MGNRGEP;** Project on Socio-Economic Survey of Street Vendors in association with **Trivandrum Corporation** as part of the National Urban Livelihood Mission Programme (NULM); Project on Old Age related Programme and Book Publication in association with **State Resource Centre.**

Consultancy Areas:

- Migration and Related Issues
- Development and Displacement, Resettlement, Rehabilitation
- Social Gerontology: Monitoring and Evaluation of Old Age Homes, Elder Issues etc.
- Social Intervention among Disaster affected People
- Issues of Excluded Communities
- Gender Studies
- Environmental Issues

7. Department of History

The Department of History has emerged as a noted centre of historical research and teaching, attracting worldwide attention and appreciation. Its image as a research institute was bolstered by the Ninety two year old 'Journal of Indian History' and the Forty year old 'Journal of Kerala Studies'. Eminent Scholars and a Vice-Chancellor have adorned the faculty of the Department.

Consultancy Areas:

- Trends in Historiography and Historical Method
- History of Modern India and Western Studies
- Constitution of India
- Consultational History of India
- Cultural Studies
- Environmental studies
- History of Socially and Educationally backward classes (affirmative action)
- Literature & History
- Interdisciplinary approach & Cultural Studies
- Social Movements in Kerala.

8. Institute of Management in Kerala

Institute of Management in Kerala, set up in 1991, offers MBA in areas General and Tourism, M.Phil and PhD. in Management studies. Many of the alumni are working as top executives and many are entrepreneurs. In 2009, IMK was rated as one of the best 7 b schools in Universities as departments in India. The faculties have consulting experience and have won many awards to their credit.

Consultancy Areas:

- Feasibility study
- Marketing Research
- Financial feasibility
- Entrepreneurship venture studies
- Customer surveys
- Organisational Restructuring
- Brand management studies

Training programmes aimed at entry level and middle level managements can also be offered based on the needs of the clients. Management Development programmes aimed at top level executives can be offered. Short term training aimed at skilled, semi- skilled and supervisory level staff can be offered on specific areas.

9. Department of Education

The Department of Education was started in 1956 and with the launch of Ph.D. programme it became one of the earliest University Departments in India to do so. The department has been recognized by the UGC, DSA scheme (1986), as National Centre for Curriculum Development in Education (1986). The Department is linked with SCERT, NCERT, Kerala State Higher Education Council and the like bodies in the Design and try out of curricular reforms. The Department has three centers namely (1) Curriculum Development Centre (2) Centre for Educational Technology **(3)** Centre for Learning Disabilities and Difficulties.

Consultancy Areas:

- Guidance and Counseling Services.
- Consultancy relating to learning disabilities & difficulties.
- Consultancy with respect to curricular innovations and reforms.
- Consultancy related to E-content Development.
- Study on teaching

10. School of Distance Education

The School of Distance Education, started in 1976 as a teaching and research department of the University of Kerala, is one of the pioneering centres of distance learning in the State. The school is offering 13 UG and 12 PG courses through distance mode of learning under language and literature, Humanities and science, Library and Information Science and IT disciplines. The School has 19 permanent faculty members with diverse academic backgrounds and rich experience in the rank of Professors, Associate Professors and Assistant Professors.

Areas of Consultancy

- Social counseling and academic consultancy
- Identifying opportunities for new business
- Project report preparation
- Market survey
- Financial viability analysis for MSMEs
- Sales tax and income tax
- Performance evaluation and management
- Mutual funds
- English editing and proofreading in sciences, social sciences, and humanities
- Preparation of Self Learning Materials(SLM)

11. Department of Political Science

Established in 1956, the Department offers M.A., M. Phil., and Ph.D. programmes. The Department has successfully completed lot of research projects funded by various national and international agencies like the Election Commission of India, Indian Space Research Organisation, Centre for the Study of Developing Societies, Department of Rural Development, Government of Kerala, Claremont Graduate University, California, US and New South Wales University, Sydney, Australia. We are also into the second stage of the Special Assistance Programme funded by the UGC. The Department itself has a Survey Research Centre which takes up many surveys and studies for Central and State Governments, Universities and other Public and Private Undertakings.

Areas of Consultancy:

- Socio-political Surveys
- Election Studies
- State and Society in India
- Public Policy Analysis
- Civil Society Movements
- Foreign Policy
- Local Governance
- Migration and Pravasi Issues
- State and Politics of Kerala
- Land Reforms
- Human Rights issues
- Training for elected Representatives
- Issues of Environment and Development
- Issues relating to transgender

Languages & Arts

1. Department of Arabic

The Department of Arabic, University of Kerala was established in 2001 with an objective to mould youngsters with capability to handle Arabic and English languages simultaneously, which are very essential to cope with the challenges of the time. The courses in the department emphasize on professional, technical and commercial areas of translation along with literature. To attain this objective the department offers various courses like, Ph.D, M. Phil, M.A and Diploma in Translation. The department has been approved by the governmental agencies like the Ministry of Home & the office of the Protector of Emigrants as their approved translation and attestation centre. We provide the highest-quality Arabic translation solutions on time and on budget; with standards for quality and accuracy. Arabic Document Translation.

Consultancy Areas:

- Arabic Simultaneous Interpretation
- Arabic Consecutive Interpretation
- Arabic Transcription
- Arabic Typesetting and Graphics
- Arabic Voiceovers and Subtitling
- Arabic Staffing Solutions
- Arabic Virtual Data Room Services
- Arabic E-Learning Support
- Legal Translation in Arabic
- Business Translation in Arabic
- Short term gulf packages: For persons want to migrate to Middle East we provide short term packages to provide them basics of communication in Arabic. Large scale of migrants from the state are settling in middle east which increases the scope of the service
- Arabic for Travellers
- Tour packages / Tour companies
- Services for Arabs who come for treatment / with Hospitals
- To Provide new methods to teach Arabic for Non-Arabic speakers, especially in the school level / Trainers
- To translate Manuscripts in Kerala to Arabic language and Arabic to Malayalam / English

2. Department of Malayalam

The Department of Malayalam has attained a very high status in teaching and research activities in the last five decades. Now we offer MA, M. Phil and Ph. D courses in Malayalam Language and Literature. Nine regular faculty members are serving in department. We own the largest department library having a collection of more than 70,000 books and a good number of journals.

Consultancy Areas:

- Correction of lexical and grammatical usage and pronunciation on of Malayalam language
- Correction of translation passages from Malayalam to English vice-versa
- Preparation of syllabus to various courses/papers of Malayalam language and literature.
- Setting of question papers and evaluation of answer scripts of various examinations/tests.
- Editing works of journals/books in Malayalam.

3. Department of Hindi

The Department of Hindi was established in the Kariavattom Campus of the University of Kerala in the year 1990. It was established with the aim of higher studies and advanced Research in Hindi Language and Literature and also for the purpose of extension of the Language. The Department has established a 30 booth Language Laboratory with all modern amenities and equipments in the year 2001. Special facilities available in the department include: Language laboratory; Smart class rooms.

Consultancy Areas:

- Translation of Classic literature,
- Official document translation,
- Translation of reports
- Cultural studies – Kerala culture (especially Marma and Kalari payattu).

4. Institute of English

The Institute of English offers PGDEC, M.A & M.Phil in English and doctoral programme. The Institute has been in the forefront of intellectual and interdisciplinary activities in the University. Its teaching methodology gives equal importance to the innovative initiative of the students and provides a supportive environment for them to develop social skills and positive social consciousness. Teachers try to improve the learning environment by integrative materials from multiple disciplines, strengthening co-curricular activities, and giving exposure in Research Methods. Modern teaching aids like audiovisual facilities are also used.

Consultancy Areas:

- Developing curriculum in English Language teaching for school teachers.
- Novel methods of language acquisition .
- Soft skills
- Copy editing
- Text editing
- Film appreciation

5. Department of Linguistics

The Department of Linguistics, University of Kerala was established in 1963. The Department promotes advanced research in all aspects of language including Theoretical Linguistics and Applied linguistics. The outcome of the Department include hundreds of dissertations, articles, study reports and research project on various aspects of linguistics. Research is going on in different areas of linguistics,such as Language teaching, Language acquisition and learning, translation, language technology, Neuro linguistics, psycholinguistics, sociolinguistics, forensic linguistics and language documentation. The Department has a Phonetics Lab with recording and Analysis facility.

Consultancy Areas:

- Language Analysis
- Language Technology and Tool making
- Development of Machine translation systems
- Translation theories, techniques and evaluation
- Language disorder, Learning disability
- Dictionary / glossary making
- language policy making and issues
- Language standardisation
- Language teaching and learning methods
- Language changes and language shift
- Tribal language studies
- Linguistic survey and identifying linguistic minorities
- Cyber linguistics and local languages
- Forensic linguistics

6. Department of Communication & Journalism

The Department of Communication and Journalism, University of Kerala was established in the year 1976, and offers a two year Masters Degree course in Communication and Journalism (MCJ), and Ph. D programme in Journalism. Majority of students who have passed out of this department are working with reputed media organizations in the country and abroad.

Consultancy Areas:

- Audience analysis for print and electronic media
- Media gratification studies for media houses
- Corporate communication services for media firms

7. Department of Islamic Studies

The Department of Islamic Studies is a center of higher learning on Islam and the history, culture and politics of the Muslim world with special focus on India in general and Kerala in particular. The Department contributes to the multi- disciplinary study of Islamic history and culture by offering M.A, M. Phil and PhD programmes. The Department has a well stocked library which stands out in South India with rare collections of books and periodicals – Marikkar Collection-in the subject. The faculty of the Department, Sri. Asharaf A extended his service to the Tourism Department, Govt. of Kerala for building Cheraman Islamic Heritage Museum at Kodungallur, a Muzris Project. Similar services can be provided with specialist expertise and consultancy in the allied branches.

Consultancy Areas:

- The Department can analyse, interpret and research complex resources in a variety of topics on Islam and Muslims to put forward ideas and make conclusions and communicate these with clarity, coherence to the concerned groups and agencies for further studies, research and action.
- The Department can also provide consultancy service to the potential employees, regarding the job prospects in the labour markets of west Asian countries which include the proper advice on working conditions, legal procedures and the life and culture of the locals in the region.
- Services can be extended to the government agencies like the Department of Education, Minority Welfare Department and other allied branches of government and non-governmental organizations including the Home Department by giving proper advice in the implementation of the programmes concerned.

8. Department of Music

The Department of Music was established on 24th July 1998. Initially the Department offered MA Music (CSS) course. A 'Sangita Mandapam' inside the Department premises was inaugurated by Dr. B. Ekbal, the then Hon. Vice-Chancellor, University of Kerala. Dr. K. Omanakutty and Dr. B. Pushpa were Heads of Depts. and presently Dr. Bhavana T.M is in charge. Since 2003, the following courses also started: MA (SDE); Ph.D (full-time & part-time); From 2006 onwards, M.Phil Degree course was started

Consultancy Areas:

- Staging of musical Concerts, Ganamelas, Jugal Bandhi, Vadya Vrindham
- Lecture Demonstrations, & Seminars
- Therapy based Musical Programmes
- Music Composing

9. Department of Sanskrit

The Department of Sanskrit started functioning in 1963 under the headship of Dr. A. G. Krishna Warrier, one of the famous Indologists of that time. The Department aims at, the promotion of higher studies and research in the different branches of Sanskrit learning. The Department offers M.A. and M.Phil in Sanskrit and facilities for research leading to Ph.D. Degree for regular students. Research and publications were given importance along with teaching. The faculty members have contributed immensely to the discipline through their books and research articles. The Department has also organized several National level seminars, refresher courses and workshops for the propagation of Sanskrit knowledge. Presently the Department offers inter-disciplinary Elective courses to Departments like Hindi, Malayalam, History, Archaeology, Psychology and Philosophy.

Consultancy Areas:

- Translation: Where the source or target language is Sanskrit.
- Correction of grammatical and lexical errors
- Editing of books or journals in Sanskrit
- Sanskrit subtitling of films, short-films and documentaries
- Motto creation for institutions, companies and in

10. Department of Tamil

Department of Tamil in the University of Kerala is instituted in the year 1944 under the headship of eminent Professor, M . Raghava Aiyangar. Department has produced many Vice chancellors to various reputed universities in Tamilnadu and other states. Now the department is conducting courses on M.A. and M.Phil. in Tamil Language and Literature. The department also offers Ph.D. and Post Doctoral programs. The Department has also organized several National and International seminars and workshops. The Department offers elective course on Tamil language to other Departments.

Consultancy Areas:

- Translation from Tamil, Malayalam & English etc.
- Editing of Manuscripts
- Tamil, Malayalam and English Lexical Works
- School Curriculum formation in Tamil Language.
- Machine Translation and Computational Tamil
- Women Empowerment
- Interpretation of Inscription
- Tribal Language Interpretation
- Editing of Journals and Books
- Legal Translation in Tamil
- Functional Tamil to Non Tamils.

Appendix -1

Forms for applying for use of sophisticated instrumentation facilities

University of Kerala
MASS Spectrometry Laboratory(DST-PURSE)

Kariavattom Campus, Trivandrum 695581

Sample Analysis Request form		**Date**	
ICP-MS/ LA-ICP-MS			
Name			
Address			
Email			
Mobile			
Sample details		No. of samples	
Elements required			
Purpose for which measurement is requested (in brief)			

Category (Tick which ever applicable) ☑

University Departments ☐	Research Institutes ☐	Other Educational ☐ Institutions
Colleges Affiliated to University of Kerala ☐	Industries ☐	

DD No.		Amount		Date		Bank	

Name and signature of the Applicant	**Recommendation of Supervising teacher (Guide)**	**Name signature and seal of (HOD / Principal / Guide / Managing Director)**

For office use

Please collect Rs_____(In word_____)
being the analysis charge for_____samples under the _____
_____category.

Lab In-Charge

Approved/ Not approved
Faculty in Charge

Recommended rates for ICP-MS Analysis per sample
(UO No. Ad F1/PURSE/2011 dated 08.01.2015)

Operational modes	University Depts.	Colleges Affiliated to UoK	Other Edu. Institutes	Research Institutes	Industries
STD*	500	750	1000	3000	4500
KED/CCT/Sensitivity Modes**	750	1000	1250	3250	4750
Rare Earth Elements®STD	750	1250	1500	3500	5000
Rare Earth KED/CCT/Sensitivity Modes	1000	1500	1750	3750	5250

** STD mode 30 elements could be analyzed which consist of - Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, Hg, In, K, Li, Mg, Mn ,Na, Ni, Pb, Rb, Se, Sr ,Tl ,V ,U, Zn.*

***KED mode is selected when poly atomic interference occur in sample analysis due to sample matrix.*

®*Applicable for Sc, Y, La, Ce, Pr, Nd, pm, Sm, Eu, Gd, Tb, Dy ,Ho, Er, Tm, Yb, Lu*

Note: *Extra charges are applicable for sample preparation. All payments are to be made under the head KUF-Miscellaneous (ICP-MS) at the university cash counter.DD should be addressed to Finance Officer, University of Kerala, payable at SBT University Campus, Thiruvanathapuram.*

No: **Date: ..../...../.....**

University of Kerala
Scanning Probe Microscope Lab Facility(DST-PURSE)
Kariavattom Campus, Trivandrum-695 581

SPM Analysis Request Form

Name:…….....
Address:….....
.....

E-mail: …..... **Mobile:** ….....

Number of samples: AFM : ☐ **Other modes (if any) :** ☐ **Sample type:** ….....

Required measurements : ….....

(I) AFM images ☐

(II) Other modes if any (specify) ….....
….....

Category

☐ Kerala University Students **(A)**

☐ Students from colleges affiliated to University of Kerala (**B**)

☐ Students from other Educational institutions **(C)**

☐ R & D institutes (**D**)

☐ Industry (**E**)

.....	.....	.....
Name and Signature of the Applicant	**Recommendation of supervising teacher** *(For researchers of Kerala University departments)*	**Name and Signature of the Head of the Institute/Dept.**

For office Use Only

Please collect Rs: … .....(In words … .....

…….….....)

being the analysis charge for … ..... samples under the … ..... Category.

Approved/Not approved

Faculty in charge **Lab In-Charge**

Charges for SPM facility: (UO No. Ad F1/PURSE/2011 dated 08.01.2015)

Operational modes	University Depts	Colleges Affiliated to UoK	Other Educational Institutes	Research Institutes	Industries
AFM imaging	300	500	1000	1500	2000
All modes other than AFM	500	800	1500	2000	3000

Note: All payments are to be made under the head KUF-Miscellaneous (SPM) at the University cash counter. DD should be addressed to Finance Officer, University of Kerala, payable at SBT University Campus, Thiruvanathapuram.

No: **Date: ..../...../.....**

University of Kerala
X-RD Laboratory (DST-PURSE)
Kariavattom Campus, Trivandrum-695 581

X-Ray Diffractometer Request Form

Name: ….....
Address: ….....
….....
….....

E-mail: ….....Mobile: ….....

Number of samples: Powder XRD: **GI XRD :**

Chemical formula: **Toxic: Yes/No**
Scan Angle: From -------- To -------.

Step Size:

Category

☐ **KU Departments (A)** | **Colleges Affiliated to KU (B)** | **Other Academic Institutes (C)**

☐ **Other R&D Institutions (D)** ☐ **Industry (E)**

Mode of Payment: DD/Cash Receipt **No. & Date:**

.....	.....	.....
Name and Signature of the Applicant	**Recommendation of supervising teacher** *(For researchers of Kerala University departments)*	**Name and Signature of the Head of the Institute/Dept.**

For office Use Only

Please collect Rs: … .....(In words … .....
.....)

being the analysis charge for … ..... samples under the … ..... Category.

Approved/Not approved

Faculty in charge **Lab In-Charge**

Charges for XRD facility: (UO No. Ad F1/PURSE/2011 dated 08.01.2015)

Operational modes	University Departments	Colleges Affiliated to university of Kerala	Other Educational Institutes	Research Institutes	Industries
Powder XRD:	300	500	1000	1500	2000
GI XRD:	500	800	1500	2000	3000

Note: All payments are to be made under the head KUF-Miscellaneous (XRD) at the University cash counter. DD should be addressed to Finance Officer, University of Kerala, payable at SBT University Campus, Thiruvanathapuram.

Appendix -2

Revised Consultancy Guidelines (2016)

1. Purpose

University of Kerala promotes the use of its intellectual and infrastructural resources for serving external organizations, agencies and individuals, not only as a source of income, but as an opportunity for teachers, technical staff, research scholars and students to involve in real life problems and gain valuable experience and to foster linkages with industries and external organizations. These guidelines are issued to streamline and enable all consultancy services offered by the Departments and Centres of the University of Kerala. The operation of the externally funded research projects **shall not** be covered under these guidelines and shall be governed by the rules framed by the University for Research Projects.

2. University Consultancy Cell (UCC)

2.1 Constitution of UCC: UCC is a body constituted for enabling, overseeing and managing consultancy services offered by the University. It shall consist of 12 members as follows:

(i) The Vice-Chancellor (Chairman)
(ii) The Pro-Vice-Chancellor
(iii) One Syndicate member nominated by the VC
(iv) The Registrar
(v) The Finance Officer
(vi) The Director (Planning & Development)
(vii) The Director of Research
(viii) Director of IQAC
(ix) – (x) Three Heads of the University Teaching Departments, nominated by the VC
(xi) One Senior Professor, nominated by the VC.

2.2 Director of UCC: One of the members nominated by the VC shall serve as the Director of the UCC and he/she shall convene UCC meetings under instructions of the VC and report to the VC on all matters relating to administration of the consultancy services.

2.3 Support for UCC: The UCC shall be provided with administrative support and secretarial assistance by the University.

3. Definitions

3.1 Consultant: A member of faculty, group of faculty members, or technical staff of University Departments, Centres and Service Centres/Depts. (such as Sophisticated Instrumentation Centre, Computer Centre etc.) who offer a service to an external organisation/agency/individual using his/her own expertise with or without the use of University infrastructure, shall be treated as consultants.

3.1 Routine Consultancy: Consultancy of a routine nature such as material testing (eg. water quality testing), analysis of samples (eg. bio-chemical parameter estimation) measurement, fabrication, calibration, data collection, data entry, and routine translation shall be considered as routine consultancy. Academic consultancy such as external student projects/internships or peer view etc. entertained in the Departments for which fees have been approved as provided in section 6.1, shall also come under

routine consultancy. The Head of the Dept./Centre shall nominally be considered the consultant for routine consultancy

3.2 Individual Consultancy: Consultancy that does not involve the use of facilities of the University/Departments/Centres and carried out by a consultant, is considered as individual consultancy.

3.3 Institutional Consultancy: Consultancy that involves the use of facilities in the University/ Departments/Centres such as equipment, computer, laboratory facilities etc. and carried out by a consultant is considered as institutional consultancy.

3.4 Sponsored Consultancy: Project sponsored by industry, non-governmental organization or other institutions and involving activities such as analysis, testing, design, survey, field trial and software development etc. is considered as sponsored consultancy.

4. Procedure for taking up Non-routine consultancy

4.1 Every consultancy shall be taken up by consultant(s) with prior consent of UCC.

4.2 A client organization may approach the Registrar, School Director, Head of the Department/Centre, Director of the Consultancy Cell or the individual consultant, for seeking consultancy service.

4.3 The request from the client (or the tender document), along with a summary note regarding the work, duration, working budget and proposed budget and all other relevant information shall be placed before the UCC by the UCC Director. The UCC shall meet as and when consultancy requests arise, and consider and dispose each application, as it deems fit. In cases of exigency or where the project outlay is less than 1 lakh, the UCC Director shall electronically circulate the details to UCC members and place the matter before the Vice-Chancellor (with comments, if any, from members) for sanction, which shall be reported to the next UCC meeting.

4.4. The UCC shall assign a unique number for each approved consultancy and the sanction letter shall be communicated in a standard format approved by the UCC, to the Head of the Department, Consultant and Client. The numbering shall commence from all consultancy projects active as on January 1, 2015.

4.5 A consultant can take part in the tender floated by various departments/bodies of state and central governments, undertakings of state and central governments, quasi-governmental organizations, corporations, organizations in co-operative sector, World Bank, United Nations and associated agencies, for offering consultancy services. Further proceedings shall be with explicit consent of UCC. In case of requirement for consultancy from any other type of entity, the consultant shall inform the UCC before proceeding with participation in tenders.

5. Budget, Accounts and Audit for Non-routine consultancy:

5.1. **Receipts of amounts**: All payments related to consultancy work shall be made by the client to the UCC Director in the form of Bank DD or cheque drawn in favour of *Director, UCC, University of Kerala*. Net banking may also be used if the client so desires. No consultant shall receive any amount in his/her name directly from the client towards consultancy work.

5.2 Consultancy budget formulation: All consultancy budgets shall consider the following 3 components:

(i) *Working Budget/Direct Expenditure***:** This shall cover actual expenditure incurred in providing the consultancy service including wages for casual engagements, field assistants etc, cost of materials,

stationary, consumables, reagents communication, travel, computing data entry etc. The consultant shall also provide for any honorarium for himself/herself under this category.
(ii) *Overhead Charges/Indirect Expenses***:** This shall be fixed at 15% for individual and 20% for institutional consultancy (ie. components *i* and *ii* will add up to 100%) and cover administrative cost and also machinery/infrastructure depreciation and charges for utilization of space, water, electricity, internet etc. In case of individual consultancy where only intellectual resource of the consultant is used, this shall be fixed at 50%.

(iii) *Service tax***:** The consultant shall propose to the client additional amount of 15% of the budget (or at rates prevalent) as service tax. In the event the client does not provide this explicitly, consultants shall provide for this under direct expenditure.

5.3 Remittance of overhead charges: The overhead charges under 5.2(ii) shall be remitted to DDF and KUF in the ratio 3:2 by the UCC Director, on completion of the consultancy. Savings, if any, from working budget shall be remitted to DDF.

5.4 Special Cases: (i) In case of large institutional projects where there is no leeway for effecting payment by the consultant, the UCC will take suitable decision for the smooth conduct of the consultancy project. (ii) For sponsored consultancy works involving only the consultant and not involving any direct expenses, guidelines for individual consultancy may be applicable, or else guidelines for institutional consultancy will be applicable. (iii) In consultancy projects where competitive bidding is involved, the percentage of overhead charges in 5.2 (iii) can be fixed suitably.

5.5 Utilization of working budget: Consultant can purchase equipments, computers, furniture and other necessary items, if rendering quality services require so and are within the working budget. All such items purchased as part of consultancy work shall be taken into stock in a separate stock register maintained by the Department. Such assets shall, after the completion of the consultancy work, be transferred to the Department. TA and DA shall be directly paid on actual from the working budget. Consultant shall maintain all record including registers, accounts and vouchers for the expenditure incurred. Registers, receipts, bills, and vouchers shall be maintained and audited by a Chartered Accountant (CA).

5.6 Transferring consultancy amount: It shall be the responsibility of the consultant to ensure that the total amount (proposed budget: 5.2(i) +(ii)+ (iii)) is transferred from the client to the UCC (in installments, if so agreed originally with the client). The Director, UCC shall remit all applicable government taxes to the concerned authorities and issue copies of the receipts to the consultant and if required, to the client.

5.7 Depositing and disbursing consultancy amount: The Director, UCC shall deposit the amount received for consultancy work in the UCC account and disburse the amount to the consultant and other parties as stated in these guidelines. The Department's share shall be transferred to DDF in favor of Head of the Department and University share shall be transferred to KUF.

5.8 Annual Statements from HODs: Annual statements of consultancy services in tabular form, giving name of consultant, name of client, budget, working budget, share to DDF and KUF, service tax remitted shall be forwarded by each Head of the Department concerned to UCC by 15th January of the succeeding year, in the format enclosed as Appendix A.

6. Budget and Accounts for Routine Consultancy

6.1Rates for routine consultancy: Rates for routine consultancy and split up of expenses including honorarium for staff involved, cost of materials etc. and an overhead of not less than 15% shall be recommended by the Departmental Council and shall be effective with the approval by the Vice-chancellor.

6.2 Receiving payments for routine consultancy: Payments for routine consultancy shall be made to the concerned Head of the Department which shall be received in the DDF.

6.3 Annual Statements from HODs: Annual statement of all routine consultancy in tabular form showing expenditure and savings shall be forwarded to the UCC by 15th January of the succeeded year by the HODs, in the format enclosed as Appendix B.

7. General

7.1 Annual Report: An annual report of routine and non-routine of consultancy shall be prepared by Director of UCC based on reports sent by HODs as mentioned in sections 5.8 and 6.3. The report shall show all consultancy works active during the calendar year, showing actual expenditure and shares received by Dept. & University in each case. For routine consultancy, figures shall be shown lumped under each specific service. This report shall be forwarded to the Registrar, FO and IQAC before 31st January of the succeeding year, in the format enclosed as Appendix C. This report shall be included in the University's Annual Report.

7.2 Income Tax exemption

Consultants shall inform clients that no TDS is to be deducted while making payment to the University in view of specific exemption under section 10 (23 C iiiab) read with circular No.4/2002 dtd. 16.7.2002 issued by CBDT.

7.2 Consultancy Certificate: Director, UCC shall issue a consultancy certificate (in the format enclosed as Appendix D, to consultants (non-routine), on request and/or on completion (to enable the reckoning of the same for career-related purposes), showing the following particulars: *1. Consultancy ID 2. Name and affiliation of Consultant, 3. Title of Consultancy,4.Type of Consultancy 5. Name of Consultancy Client, 6. Consultancy Budget including service tax, 7. Date of commencement and completion, 8. Amount remitted to DDF and KUF 9. Equipment's, if any, transferred to Dept. 10. Any other remarks.*

Appendix-A

ANNUAL REPORT OF
NON-ROUTINE CONSULTANCY
FROM DEPTS/CENTRES

To be submitted by 15th January of each year, for the previous year

Name of Department:…….. Year …….

CONSULTANCY No ……..	
Name of Consultant	
Name of Client	
Budget (i) Working Budget	
Budget (ii) Overhead Charges	
Share to DDF and KUF	
Service Tax Remitted	
CONSULTANCY No ……..	
Name of Consultant	
Name of Client	
Budget (i) Working Budget	
Budget (ii) Overhead Charges	
Share to DDF and KUF	
Service Tax Remitted	
CONSULTANCY No ……..	
Name of Consultant	
Name of Client	
Budget (i) Working Budget	
Budget (ii) Overhead Charges	
Share to DDF	
Service Tax Remitted	
Share to KUF	
CONSULTANCY No ……..	
Name of Consultant	
Name of Client	
Budget (i) Working Budget	
Budget (ii) Overhead Charges	
Share to DDF and KUF	
Service Tax Remitted	
General remarks, if any	

Date……. Head, Dept. of ……

Appendix-B

ANNUAL REPORT OF
ROUTINE CONSULTANCY
FROM DEPTS/CENTRES

To be submitted by 15th January of each year, for the previous year

Name of Department:…….. Year …….

Sl. No.	Name of Routine Consultancy Service	No. of Cases	Expenditure	Savings
Remarks if any:				

Date…….

Head, Dept. of ……

Appendix-C

University Consultancy Cell
University of Kerala

CONSOLIDATED CONSULTANCY STATEMENT FOR THE YEAR .....

NON-ROUTINE CONSULTANCY						
Sl. No.	**Consultancy ID**	**Consultant**	**Client**	**Budget**	**Overheads Remitted to both DDF & KUF**	**Remarks**
			TOTAL			

ROUTINE CONSULTANCY				
Sl. No.	**Department**	**Type of Service**	**Total Earnings**	**Overheads**
		TOTAL		

To be submitted to the Registrar, FO and IQAC by year for the previous year by January 31st.

University Consultancy Cell
University of Kerala

ww.keralauniversity.ac.in/consultancy

Certificate

1. Consultancy ID :
2. Consultant (& affiliation) :
3. Consultancy Title :
4. Type of Consultancy :
5. Total Budget :
6. Working Budget :
7. Overheads :
8. Service Tax :
9. Date of Commencement :
10. Date of Completion :
11. Amount Remitted to KUF :
12. Amount Remitted to DDF :
13. Equipments, if any, transferred to University :
14. Any other Remarks :

Date……..

Director, UCC…….

SOPHISTICATED INSTRUMENTATION
AND COMPUTATION CENTRE