

**ADD ON COURSE**

**PLANT TISSUE**

**CULTURE**



ज्ञान-विज्ञान विमुक्तये

**UNIVERSITY GRANTS COMMISSION**  
**CAREER ORIENTED COURSES**  
**35-FEROZSHAH ROAD**  
**NEW DELHI-110 001**

F. No. 4-332 /2010 (COC)

March, 2010

22 MAR 2010

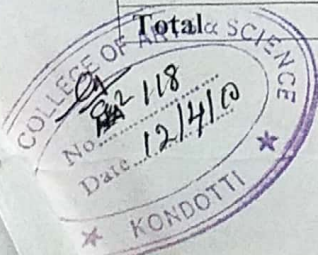
The Under Secretary (FD-III)  
University Grants Commission  
New Delhi-110002

**Sub:** - Release of Grants-in-aid to **E.M.E.A College of Arts & Science, Kondotty, Dist. Malapuram, Kerala-673638** for Career Oriented Courses under p in.

Sir,

With reference to the proposal submitted by **E.M.E.A College of Arts & Science, Kondotty, Dist. Malapuram, Kerala-673638** under the UGC scheme of Career Oriented Courses, I am directed to convey the approval of the University Grants Commission for starting the following Career Oriented Courses in the above mentioned College from the academic year **2010-11**.

Courses Approved	Seed Money (Rs. in lakh)
<u>Sciences</u>	
1. Plant Tissue Culture	10.00
<b>Total</b>	<b>10.00</b>



*Handwritten signature in red ink.*

I am also directed to convey the sanction of the University Grants Commission for payment of **Rs. 10,00,000/-** (Rupees Ten Lakh only) to **E.M.E.A College of Arts & Science, Kondotty, Dist. Malapuram, Kerala-673638** as one time grant (Seed Money) under the scheme of Career Oriented Courses.

The assistance available in the programme is only in the form of a one – time as “**Seed Money**”. The amount may be utilized for the purchase of books and journals augmentation of laboratory facilities, equipment and payment of remuneration to the Guest faculty only.

The terms and conditions of the approval and grant released are as per the guidelines of the scheme.

1. The sanctioned amount is debitible to the major Head 5.(i) (Career Oriented to Education). The above sanction is valid for payment during the current financial year **2009-10**.
2. The amount of grant shall be drawn by the Joint Director (Drawing and Disbursing Officer), University Grants Commission on the Grants –in –aid bill and shall be disbursed to the credited to the Principal, **E.M.E.A College of Arts & Science, Kondotty, Dist. Malapuram, Kerala-673638** through Demand Draft/Mail Transfer.
3. The grant is subject to the adjustment on the basis of Utilization Certificate in the prescribed proforma submitted by the University/College/Institution.
4. The University/College shall maintain proper accounts only on approved items of expenditure.
5. The Utilization Certificate to the effect that the grant has been utilized for the purpose for which it was sanctioned shall be furnished to the University Grants Commission as early as possible after the close of the current financial year.
6. The assets acquired wholly or substantially out of the University Grants Commission grant shall not be disposed or encumbered or Utilized for the purposes other than those for which the grant was given, without proper sanction of the University Grants Commission and should, at any time the college ceases to function, such assets shall revert to the University Grants Commission.
7. A Register of Assets acquired wholly or substantially out of the grant shall be maintained by the University in the prescribed form.
8. The grantee institution shall ensure the Utilization of grants-in-aid for which it is being sanctioned/paid. In case non-utilization/part utilization, the simple interest @ 10% per annum as amended from time to time on unutilized amount from the date of drawl to the date of refund as per provisions contained in General Financial Rules of Govt. of India will be charged.
9. **The University/College shall implement the programme from the academic year 2010-11 positively and UGC to be informed in this regard.**

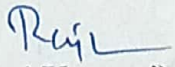
10. The interest earned by the University/College/Institute on this grants in aid shall be treated as additional grant and may be shown in the U.C./Statement of expenditure to be furnished by grantee institutions.
11. The University/College shall follow strictly all the instructions issued by the Govt. of India from time to time with regard to reservation of posts for scheduled Caste and Scheduled Tribes.
12. The University/College shall fully implement the Official Language Policy of Union Govt. and comply with the Official Language Act, 1963 and Official Language (use for officially purpose of the Union) Rules, 1976 etc.
13. The Sanction issues in exercise of the delegation of powers vide Commission office order No. 25/92 dated May.01, 1992.
14. The funds to the extent are available under the scheme and has been noted in BCR for the year **2009-10** at S. No. 448 Page No. 67.

Yours faithfully,

(Dr. (Mrs.) H.K. Chauhan)  
Joint Director

Copy forwarded for information and necessary action to: ✓

1. The Principal, **E.M.E.A College of Arts & Science, Kondotty, Dist. Malapuram, Kerala-673638** to intimate the receipt of the letter as well as the receipt of the sanction grant.
2. The Secretary to the Government of **Kerala**, Deptt. of Education, **Thiruvananthapuram**.
3. The Registrar, **Calicut University, Calicut**.
4. Joint Secretary/Joint Director South Eastern Regional Office P.B. No. 152, A.P.S.F.C. Building, IVth Floor 5-9-194 Chirag Ali Lane, Hyderabad-500001 (A.P.).
5. Office of Director, General, Audit General Revenues, AGCR Bldg., I.P. Estate, New Delhi.
6. Guard File, UGC, New Delhi.

  
(Raj Kumari)  
Under Secretary

APPLICATIONS ARE INVITED FOR ADD-ON COURSE ON

"PLANT TISSUE CULTURE"

Applications are invited for Calicut University certified Add on Course, Advanced Diploma in "PLANT TISSUE CULTURE". The course comprises total 300 Hrs with 125 Hrs Theory and 175 Hrs Practical. Those students who are interested to participate are directed to submit the application on before 04/ 11/ 2014 with a fee of Rs 500. Application form can be had from Head, Dept. of Biotechnology. The course will start on 10<sup>th</sup> November 2014. The duration of the course may be extended to six months. Classes will be at afternoon (3.30pm- 5.30pm except Friday and all Saturdays). Preferences will be given to the III<sup>rd</sup> and V<sup>th</sup> Semester science students.

Place: KONDOTTI

Date: 23-10-2014

  
PRINCIPAL

**UNIVERSITY OF CALICUT  
(Pareeksha Bhavan)**

Calicut University P.O,  
Pin - 673 635.

No.ES XIV/COP/Exam/2015

Date: 19/01/2015.

**NOTIFICATION**

It is hereby notified for the information of all concerned that the Add-on course (UGC Aided Career Oriented Programme) examination for 2013 and 2014 admissions (2013-14 & 2014-15 academic years) will be conducted in April 2015. The colleges offering Add-on courses (Certificate, Diploma & Advanced Diploma) are therefore directed to forward the following documents to the undersigned on or before 20-02-2015.

1. A copy of the nominal roll of the candidates.
2. Proof for date of birth/caste etc. (Front page of SSLC book necessary)
3. A photocopy of the plus two marklists of the candidates admitted for the course.
4. A chalan receipt for Rs. 5000/- (Rupees Five Thousand Only) per course as administrative fee.
5. A copy of the sanction order from the UGC specifying the period upto which the course is sanctioned.
6. A copy of the sanction order from the University for starting the course.
7. Four sets of model question paper on each subject with 75 marks and 3 hours duration for Certificate/Diploma/Adv. Diploma Courses. Question paper has to be prepared as per scheme of Add-on course approved by the Board of studies/Academic Council. The model question paper should be neatly typed/printed and should be enclosed in a sealed cover. Manuscripts will not be accepted.
8. It is also informed that the colleges have to conduct the Add-on Course examinations in the colleges itself, strictly as per the UGC guidelines and upload the marks of the theory and practical/project work etc. (75 +25 marks) to the web page provided soon after the examination and forward the hard copy to this office. The University will provide the question papers. There is no examination fee for Add-on Course.

Sd/-

Controller of Examinations

To  
The Principals of the colleges concerned.

Copy to  
PS to VC/PA to PVC/PA to Registrar/PA to CE/  
System Administrator/PRO/Exam enquiry/FC/DF

PH:0494 2407265, 0494 2407214

# E.M.E.A. COLLEGE OF ARTS AND SCIENCE

Re-accredited with 'A' Grade by NAAC  
(Aided, affiliated to the University of Calicut)  
KONDOTTI, P.O. KUMMINIPARAMBA  
MALAPPURAM (DIST), PIN. 673 638

☎ : (0483) 2712030 (Off.)  
2713530 (Pri.)  
E-mail: mail@emeacollege.ac.in  
Website: www.emeacollege.ac.in

G2-118/10

Date: 16-02-2015

From

THE PRINCIPAL.

To

The Controller of Examinations,  
University of Calicut,  
P. O. Calicut University.

Sir,

Sub: - Career Oriented Programme – Add-on course- Plant Tissue Culture –  
Documents – Forwarding of.

Ref:- Your letter No. Es. XIV/COP/Exam/2015 dated 19-1-2015.

I am forwarding herewith the following documents required for conduct of university examinations of Add – on course conducted in this college in plant tissue Culture during 2013 – 2014 and 2014 – 2015.

1. Nominal roll of the candidates.
2. Photocopy of the front page of SSLC Book (proof for date of birth)
3. Photocopy of the plus two mark lists of the candidates.
4. Challan receipt for Rs. 5000/- as administrative fee.
5. Copy of the sanctioning order from UGC.
6. Four sets of model question papers in separate sealed cover.

In this connection I may inform you that since the candidates for the year 2013-2014 have left the college on completion of the course. The copy of the certificates could not be produced within the stipulated period. It will be produced on calling from you.

I request that the examination for the years 2013-14 and 2014-15 may be conducted at the earliest.

Yours faithfully,

R. \_\_\_\_\_

PRINCIPAL  
E.M.E.A. COLLEGE OF ARTS  
& SCIENCE, KONDOTTI  
MALAPPURAM DT. 673 638

Sent through  
message to  
H.O. on 20/2/15

KONDOTTI

# CERTIFICATE COURSE IN PLANT TISSUE CULTURE

Theory (125hr)

## SYLLABUS

### Unit I (12 hr)

History of plant tissue culture, Concepts of cell culture. Development of tissue culture  
Role of auxin, discovery of cytokinin, Hormonal control of organ formation  
Improvement of media, Preparation and cloning of single cell cultures, Regeneration of  
single cell to whole plant, Recent advances.

Laboratory organization- Washing and storage facilities, Media preparation room,  
observation and data collection area, Washing and handling of laboratory glass ware,  
Equipments used for plant tissue culture.

### Unit II (10 hr)

Culture media- media composition, Macro and micronutrients, Organic supplements  
Growth regulators, Solidifying agents, Media preparation, selection of new medium,  
Different media

### Unit III (7 hr)

Aseptic manipulation- Sterilization of culture vessels and instruments, Sterilization of  
nutrient media, Sterilization of culture room and transfer area, Aseptic culture techniques

### Unit IV (12 hr)

Cell culture, Isolation of single cells, Growth and subculture of suspension culture, Types of suspension cultures, Culture medium for suspension cultures, Synchronization of suspension cultures, measurement of growth in suspension cultures, Viability of cultured cells, Culture of isolated single cells, Application of cell culture.

### Unit V (6 hr)

Cellular totipotency, Vascular differentiation, Culture systems, Organogenic differentiation, Totipotency of epidermal cells and Crown gall cells.

### Unit VI (10 hr)

Somatic embryogenesis, Somatic embryogenesis in dicotyledenous and monocotyledenous cultures, embryo maturation and plantlet development, Loss of morphogenic potential in embryonic cultures, application of somatic embryogenesis, somatic embryos versus zygotic embryos.



Unit VII (10 hr)

Joy's Haploid production, Techniques of androgenesis, Factors influencing anther culture, Differentiation of pollen into gametophytic or sporophytic cells, development of androgenic haploids, Induction of haploids from unpollinated ovaries, Diploidization of haploid plants, Application of haploids in plant breeding, Problems associated with haploid production.

Unit VIII (5 hr)

Triploid production- Methodology, Histology and cytology of callus, Application of triploids in plant improvement.

Unit IX (5 hr)

*In vitro* pollination, Methodology, Factors affecting seed-set after *in vitro* pollination, Application of *in vitro* pollination.

Unit X (6 hr)

Zygotic embryo culture, types of embryo culture, Methodology, Nutritional requirements, Role of suspensor in embryo culture, Precocious germination, Organogenic potential of embryo callus, Practical application.

Unit XI (12 hr)

Joy's Somatic hybridization and cybridization, Isolation of protoplasts, Culture of protoplasts, Protoplast regeneration, Protoplast fusion, selection of somatic hybrid and cybrids, Assessment of somatic hybrid and cybrid nature of plants, Practical application of somatic hybridization and cybridization.

Unit XII (12 hr)

Joy's Clonal propagation- Methodology, Multiplication by axillary and apical shoots, Multiplication by adventitious shoots, Multiplication through callus culture, Factors affecting shoot multiplication, Factors affecting *in vitro* rooting, acclimatization of plants transferred to soil, Clonal multiplication of woody species, Technical problems in micro propagation, application of micro propagation.

Unit XIII (12 hr)

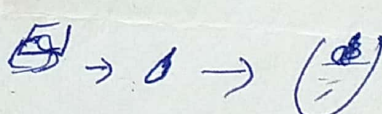
General applications- Industrial application, Advances in tissue culture for synthesis of useful compounds, Selection of cell lines for high yields, Mass cultivation of plant cells, Different types of bioreactors, Biotransformation using plant cell cultures, Factors limiting large scale production of useful compounds.

Unit XIV (6 hr)

Joy's Germplasm conservation, Modes of conservation, Material used for conservation, Freeze preservation, Cold storage, Low pressure and low oxygen storage, Application and limitation.

# PRACTICALS

Total 175 hours

1. Plant cell counting using hemocytometer.
2. Measurement of plant cell growth.
3. Familiarization of laboratory equipments.
4. Guidelines for washing & handling of glass wares.
5. Aseptic transfer techniques.
6. Sterilization and media preparation.
7. pH meter and adjustments, preparation of solutions, dilution of solutions.
8. Establishment of callus cultures from carrot cambial explants.
9. Establishment of shoot cultures. *herbs*
10. Induction of adventitious shoots. *expl. nodal/internodal / Kinetin (500 mg/100ml) bud explant (shoot st tip)*
11. Embryo culture of maize. *ms basal medium (without hormones) seeds*
12. Micro propagation of African violet. *dry soak in water*  

13. Isolation of plant protoplast from flower petals. *cellulase / macerozyme (1%) in mannitol (5%) solution*
14. Protoplast viability staining. *trypan blue / Carotene*
15. Isolation of plant cell vacuoles. *24 hrs incubate*
16. Protoplast fusion. *unstained / stained - dead* | *centrocytation* | *mannitol / sucrose soln*
17. Mutagenesis of *Pandorina morum* cells.
18. Characterization of Chlorate resistant mutants.
19. Electrophoretic characterization of MoCo- deficient mutants.
20. Ketolactose test for *Agrobacterium* biotype
21. Examination of the plate for the presence of a yellow halo around the bacterial colonies.
22. Isolation of DNA from plant cells.
23. Isolation of Chloroplast DNA.

24. Detection of antifungal secondary metabolites produced by plant tissue.
25. Use of *Pandorina morum* cells to produce allelopathic secondary metabolites.
26. Immobilisation of enzymes using sodium alginate.
27. Immobilisation of  $\alpha$ -amylase by cross linking.

Verified by IQAC EMEA -2019

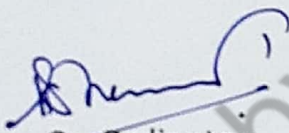


**EMEA COLLEGE OF ARTS AND SCIENCE, KONDOTTI**  
KUMMINIPARAMBA. P.O, PIN 673638


**DEPARTMENT OF MICROBIOLOGY**

**CERTIFICATE**

This is to certify that Mr./Ms. Aysha Bincy  
of IV SEM BIOTECH.....has successfully completed the UGC Sponsored  
Certificate Course in Tissue Culture (Course Duration Sixty Hours) conducted by  
Department of Microbiology during the academic year 2016-17.

  
Course Co-Ordinator



  
Principal

Date of issue: 10/02/17

PRINCIPAL  
EMEA COLLEGE OF ARTS  
& SCIENCE, KONDOTTI  
MALAPPURAM DT., 673 638

UTILISATION CERTIFICATE

ANNEXURE IV

It is certified that grant of Rs. 1000000/- (Rupees ten lakh only) approved by the University Grants Commission for Career Orientation course 'Plant Tissue Culture', out of the total grant, an amount of Rs. 8,28,250/- (Rupees eight lakh twenty eight thousand two hundred fifty only) has been utilized up to 31-03-2017 as per details given in the University Grants Commission in its letter no. F. No. 4-332/2010(COC) dated 22-03-2010 and that all these terms and conditions have been fulfilled by the college and the grant has been utilized for the purpose for which it was approved.

It is further certified that inventories of permanent or semi-permanent assets created/acquired wholly or mainly out of the grants given by the University Grants Commissions indicated above are being maintained in the prescribed form and are being kept up to date and these assets have not been disposed off encumbered or utilized for any other purposes.

If as a result of check or audit objection, some irregularity is noticed at a later stage, the college shall be bound to refund the amount objected to.

For **AYYAR & ASSOCIATES**  
CHARTERED ACCOUNTANTS

Signature:

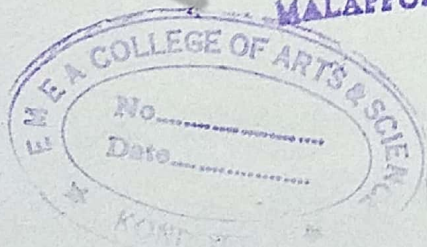
(Chartered Accountant/Government Auditor)  
S. DHARMA RAJA A.Y. B.Com, FCA  
(Proprietor) Memb. No: 018019  
Firm Regn. No: 007611S

(Non-Govt. College)/(Govt. Colleges/Universities)

Signature:

(Registrar/Principal)

**PRINCIPAL**  
**EMEA COLLEGE OF ARTS**  
**& SCIENCE, KONDOTTY**  
**MALAPPURAM DT. 673 638**



SEAL

Principal  
EMEA COLLEGE OF ARTS AND SCIENCE  
KUMMINIPARAMBA - PO, KONDOTTY  
MALAPPURAM Dt. - 673638