CENTRAL UNIVERSITY OF KERALA
केरल केन्द्रीय विश्वविद्यालय

Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>

Requesting the approval of the revised M.Sc Botany syllabus of CUK plant Science-reg.

7 messages

Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in> Thu, Feb 18, 2021 at 1:07 PM
To: profkrchandrashekar@gmail.com
Cc: Parimelazhagan Thangaraj <drparimel@gmail.com>, Janardhana GR <grjbelur@gmail.com>, Sivaram V <sivaram900@gmail.com>, "Dr Dennis Thuruthiyil T." <den_thuruthiyil@cukerala.ac.in>, Ramachandran Kotharambath <ram@cukerala.ac.in>, Ginny Antony <ginnyantony@cukerala.ac.in>

Dear Sir/Madam

Greetings from Dept of Plant science, Central University of Kerala.

I am thankful to all the members for your continuous support and contribution for the successful conduct of BOS meeting held online on **12th Feb 2021.**
Here I attached the M.Sc Botany revised syllabus by incorporating the suggestions of the experts in the following points.

1) Revision carried out by incorporating the Programme objectives and outcome and all courses objectives and outcome.

2) Revision carried out by incorporating a list of practicals for newly introduced two skill based elective courses listed at the end as

i. BTY 5007 Hands on training on Plant metabolites and Drug discovery
ii. BTY 5008 Organic Farming

3) List of suggested 14 MOOCs for choice for elective courses

As our Academic council meeting is scheduled on 23-02-2021, I request all the experts to approve the attached syllabus through by mail on or before 21-02-2021.

Thanks once again.

Regards

Dr.K.Arunkumar, Ph.D
Professor & Head
Department of Plant Science
School of Biological Sciences
Central University of Kerala
Periye-671 320
Kasaragod,Kerala, India
Mobile: 91-9865051016
http://www.cukerala.ac.in/index.php?option=com_content&view=article&id=601&Itemid=410&lang=en

2 attachments

MOOC list .docx
18K

Syllabus M.Sc PLS -2020-21-GA.docx
222K

Ramachandran Kotharambath <ram@cukerala.ac.in> Thu, Feb 18, 2021 at 1:24 PM
To: Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>
Cc: profkrchandrashekar@gmail.com, Parimelazhagan Thangaraj <drparimel@gmail.com>, Janardhana GR <grjbelur@gmail.com>, Sivaram V <sivaram900@gmail.com>, "Dr Dennis Thuruthiyil T." <den_thuruthiyil@cukerala.ac.in>, Ginny Antony <ginnyantony@cukerala.ac.in>

Dear Sir

I approve the syllabus.

Sincerely
Ram

[Quoted text hidden]
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Ramachandran Kotharambath | Assistant Professor | Department of Animal Science | Central University of Kerala | Tejaswini Hills, Periya | Kasaragod, Kerala | India

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Sivaram V <sivaram900@gmail.com> Thu, Feb 18, 2021 at 1:31 PM
To: Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>
Cc: profkrchandrashekar@gmail.com, Parimelazhagan Thangaraj <drparimel@gmail.com>, Janardhana GR <grjbelur@gmail.com>, "Dr Dennis Thuruthiyil T." <den_thuruthiyil@cukerala.ac.in>, Ramachandran Kotharambath <ram@cukerala.ac.in>, Ginny Antony <ginnyantony@cukerala.ac.in>

Dear Dr Arun Kumar

I am herewith accepting the M Sc Botany Syllabus of CKU.

regards,

Sivaram
[Quoted text hidden]

Chandrashekar K R <profkrchandrashekar@gmail.com> Thu, Feb 18, 2021 at 2:00 PM
To: Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>

Dear Dr Arun Kumar,
The M. Sc. Syllabus of Plant Science of CUK is here by approved.
Chandrashekar K R

On Thu, 18 Feb 2021, 12:54 pm Arun Kumar K Faculty Plant Science, <arunkumark@cukerala.ac.in> wrote:
[Quoted text hidden]

Ginny Antony <ginnyantony@cukerala.ac.in> Fri, Feb 19, 2021 at 3:57 AM
To: Sivaram V <sivaram900@gmail.com>
Cc: Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>, profkrchandrashekar@gmail.com, Parimelazhagan Thangaraj <drparimel@gmail.com>, Janardhana GR <grjbelur@gmail.com>, "Dr Dennis Thuruthiyil T." <den_thuruthiyil@cukerala.ac.in>, Ramachandran Kotharambath <ram@cukerala.ac.in>

Syllabus approved. Thank You for the efforts from all.
[Quoted text hidden]

Dr Dennis Thuruthiyil T. <den_thuruthiyil@cukerala.ac.in> Thu, Feb 18, 2021 at 3:34 PM
To: Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>

Syllabus approved.
Dennis
[Quoted text hidden]

Parimelazhagan Thangaraj <drparimel@gmail.com> Thu, Feb 18, 2021 at 4:22 PM
To: Ginny Antony <ginnyantony@cukerala.ac.in>
Cc: Sivaram V <sivaram900@gmail.com>, Arun Kumar K Faculty Plant Science <arunkumark@cukerala.ac.in>, profkrchandrashekar@gmail.com, Janardhana GR <grjbelur@gmail.com>, "Dr Dennis Thuruthiyil T." <den_thuruthiyil@cukerala.ac.in>, Ramachandran Kotharambath <ram@cukerala.ac.in>

Dear Prof,

I am accepting and approving the syllabus.

Thank you

Parimel.

On Thu, Feb 18, 2021 at 3:27 PM Ginny Antony <ginnyantony@cukerala.ac.in> wrote:
[Quoted text hidden]

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Dr. Parimelazhagan Thangaraj, Ph.D.
Professor
Department of Botany
Bharathiar University
Coimbatore - 641046

Mobile: 8903001973
E-mail: drparimel@gmail.com; drparimel@buc.edu.in

பாரதியார் பல்கலைக்கழகம்
Bharathiar University
Re-accredited at the "A" Grade Level by NAAC
Coimbatore, Tamilnadu, INDIA.

BTY 5007:Hands on training on Plant metabolites and Drug discovery

(Credits 3; Theory 2 ;Practical 3 hrs)

Objectives	This course is designed to teach, • Tissue culture techniques for mass culturing of plant cells for extraction • Extraction, separation, identification and bio-evaluation of phytochemicals.
Learning outcomes	Upon successful completion of this course, students are ➢ Able to know how to cultivate the microbes and plants cells ➢ have the knowledge on the extraction, isolation, purification and characterization of bioactive compounds of commercial importance. ➢ will have the competence to initiate start-ups or job opportunity in phytochemical and pharmaceutical industries.
S.No	
1.	**Plant resources:** Plant cell cultures including bacteria, fungi, algae, callus production.
2.	**Methods of Extraction:** Solvent Extraction methods-Maceration,Decoction, Reflux extraction, Soxhlet extraction, ultrasonic and microwave-assisted extraction. **Methods of Separation, Isolation and concentration:** Separation by solvent method-polarity gradient separation; precipitation methods, salting out, dialysis**;** Separation byChromatography Ion- exchange, gel-filtration, HPLC and HPTLC; Concentration by evaporation- Lyophilization and flash evaporation.
3.	**Identification of phytochemicals by chromatographic techniques:** Phenolic Compounds, Terpenoids, Organic Acids, Lipids and Related Compounds, Nitrogen Compounds, Sugars and their Derivatives, Macromolecules like nucleic acids; Proteins; Polysaccharides by HPLC and HPTLC.
4.	**Biosynthesis and characterization of nanoparticles:** Silver nanoparticle synthesis using plant extracts like polysaccharides, Phenolic Compounds and Terpenoids.
5.	**Identification and characterization of phytochemicals by various analytical and spectroscopic methods:** UV/Visible, Fluorescent, FTIR and XRD and FE-SEM.

6.	**Bio-evaluation:** Anti-oxidants, Anti-viral, Anti-bacterial, anti-fungal and anti-cancer by cell line assay.
7.	**Practicals:** • Introducing basic protocols in cell culture-Bacteria, Fungi, Algae and Callus. • Analysis of monosaccharide components in poly/oligosaccharides by HPLC • Soxhlet extraction of plant metabolites • Extraction and partial purification of crude enzyme samples • Gel filtration chromatography for separation of oligosaccharides • Concentration of the plant/algal extracts by lyophilisation and flash evaporation. • Silver nanoparticle synthesis using plant/algal polysaccharides
	• Identification of phenolic compounds by HPTLC • Characterization of plant/algal polysaccharides by FTIR • Isolation and characterization of plant/algal polysaccharides using XRD • Analyzing antioxidant/anticancer/antiviral properties of plant/algal polysaccharides

Reference Manuals:

1. Arunkumar,K., Rathinam Raja, V. B. Sameer Kumar, Ashna Joseph, T. Shilpa and Isabel S. Carvalho. 2020. Antioxidant and cytotoxic activities of sulfated polysaccharides from five different edible seaweeds, *Journal of Food Measurement and Characterization*,51.
2. Hahn-Deinstrop E. Applied Thin Layer Chromatography:Best practice and avoidance of Mistakes. Wiley-VCH, Weinheim, Germany. 2000.
3. Hancock WS. High Performance Liquid Chromatography in Biotechnology. Wiley- Interscience, New Jersey, USA. 1990.
4. Harborne JB. Phytochemical Methods: A guide to modern techniques of plant analysis. 2nd Edition. Chapman and Hall publishers: 3, Springer. Germany.1998
5. Jim Clark (Chemguide.co.uk); Introducing Chromatography: Thin Layer Chromatography; Jun 6, 2019
6. Katz ED. High Performance Liquid Chromatography:Journal of Pharmacognosy and Phytochemistry Principle and Methods in Biotechnology (Separation science Series). John wiley& sons, New Jersey, USA.1995
7. Mark F. Vitha Spectroscopy: Principles and Instrumentation ISBN: 978-1-

119-43664-5
8. Roseline, T.A., Murugan, M., Sudhakar, M.P., Arunkumar, K.2019. Nanopesticidal potential of silver nanocomposites synthesized from the aqueous extracts of red seaweeds, *Environmental Technology and Innovation*, 13 , pp. 82-93.