University of Mumbai

No. AAMS (UG) /1145 of 2021

CIRCULAR:-

Attention of the Principals of the Affiliated Colleges and Directors of the recognized Institutions in Faculty of Science and Technology.

They are hereby informed that the recommendations made by the Ad-hoc Board of Studies in **Home Science** at its meeting held on 20th March, 2021 **vide** item No. **1(iv)** and subsequently passed by the Board of Deans at its meeting held on 11th June, 2021 **vide** item No. **8.5** have been accepted by the Academic Council at its meeting held on 29th June, 2021, **vide** item No. **8.5** and subsequently approved by the Management Council at its meeting held on 29th July, 2021 **vide** item No. **16** and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 74(4) of the Maharashtra Public Universities Act, 2016 (Mah. Act No. VI of 2017) the Ordinance **6681 & 6682** Regulations **9424 & 9425** and the syllabus of **Add-On Certificate Course in Technological Skills in 21st Century** has been introduced and the same have been brought into force with effect from the academic year **2022-23**, accordingly. (The same is available on the University's website www.mu.ac.in).

(Sudhir S. Puranik)
REGISTRAR

MUMBAI – 400 032
25th October, 2021
To,

The Principals of the Affiliated Colleges and Directors of the recognized Institutions in Faculty of Science and Technology. (Circular No. UG/334 of 2017-18 dated 9th January, 2018.)

A.C/8.5/29/06/2021
M.C/16/29/07/2021

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No. AAMS (UG) /1145-A of 2021 MUMBAI-400 032 25th October, 2021

Copy forwarded with Compliments for information to:-

1) The Chairman, Board of Deans
2) The Dean Faculty of Science and Technology,
3) The Chairman, Ad-hoc Board of Studies in Home Science,
4) The Director, Board of Examinations and Evaluation,
5) The Director, Board of Students Development,
6) The Co-ordinator, University Computerization Centre,

(Sudhir S. Puranik)
REGISTRAR

Copy to :-

1. **The Deputy Registrar, Academic Authorities Meetings and Services (AAMS),**
2. **The Deputy Registrar, College Affiliations & Development Department (CAD),**
3. **The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Department (AEM),**
4. **The Deputy Registrar, Research Administration & Promotion Cell (RAPC),**
5. **The Deputy Registrar, Executive Authorities Section (EA),**
6. **The Deputy Registrar, PRO, Fort, (Publication Section),**
7. **The Deputy Registrar, (Special Cell),**
8. **The Deputy Registrar, Fort/ Vidyanagari Administration Department (FAD) (VAD), Record Section,**
9. **The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari,**

They are requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to in the above circular and that on separate Action Taken Report will be sent in this connection.

1. **P.A to Hon'ble Vice-Chancellor,**
2. **P.A Pro-Vice-Chancellor,**
3. **P.A to Registrar,**
4. **All Deans of all Faculties,**
5. **P.A to Finance & Account Officers, (F.& A.O),**
6. **P.A to Director, Board of Examinations and Evaluation,**
7. **P.A to Director, Innovation, Incubation and Linkages,**
8. **P.A to Director, Board of Lifelong Learning and Extension (BLLE),**
9. **The Director, Dept. of Information and Communication Technology (DICT) (CCF & UCC), Vidyanagari,**
10. **The Director of Board of Student Development,**
11. **The Director, Department of Students Walfare (DSD),**
12. **All Deputy Registrar, Examination House,**
13. **The Deputy Registrars, Finance & Accounts Section,**
14. **The Assistant Registrar, Administrative sub-Campus Thane,**
15. **The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan,**
16. **The Assistant Registrar, Ratnagiri sub-centre, Ratnagiri,**
17. **The Assistant Registrar, Constituent Colleges Unit,**
18. **BUCTU,**
19. **The Receptionist,**
20. **The Telephone Operator,**
21. **The Secretary MUASA**

for information.

(Appendix 'B')

New ordinances 6681 & 6682 relating to the Add – On Certificate Course in Technological Skills in 21st Century.

1. Necessity for starting this course:

This course is for beginners and for artists who want to bring alive their assets/work/ideas. The course can be applied across different fields and is meant for cross curricular use. The course aims to promote an awareness of the changing and progressive nature of technology. It will provide opportunities for students to apply and refine design approaches towards a viable solution.

This course aims to provide a technical platform to the eager minds to build knowledge and gain hands on experience in the field of robotics which has gained attention over the last decade in various fields.

Subject experts will be drawn from premier industries and other reputed research institutes

Specific Objectives:

1. The course will enable the learners to design robotic creation and specific programs for handling various inputs and outputs in real time

2. The course will provide knowledge and ideas on the latest developments in the field of robotics and automation.

3. The course will also help to identify future research needs in the interdisciplinary research fields.

4. The course will strengthen analytical thinking, design skills and computational thinking enabling students to develop games and apps.

2. Whether UGC has recommended to start the said course?

A. Yes. UGC has recommended skill based/vocational/technical courses.

3. Whether all the courses have commenced from the academic year 2019-20

A, We plan to commence the courses from academic year 2022 - 23

4. The courses started by the University are self financed, whether adequate number of eligible permanent Faculties are available?

A. The courses are self financed. Adequate permanent faculties are available to facilitate the running of the courses.

5. To give details regarding duration of the course and is it possible to compress the course

A. It is possible to complete the courses during the academic year. It is not possible to further compress the courses.

6. The intake capacity of each course and number of admissions given in the current academic year 2019-20

A. Maximum 30 students in a batch

7. Opportunities of Employability/Employment available after taking these courses.

A. Many new opportunities are available after the courses

AC- 29/06/2021
Item No. – 8.5 (N)

UNIVERSITY OF MUMBAI

ADD – ON CERTIFICATE COURSE IN TECHNOLOGICAL SKILLS IN 21ST CENTURY

(to be introduced with effect from the academic year 2022-23)

UNIVERSITY OF MUMBAI

Syllabus for Approval

Sr. No.	Heading	Particulars
1	Title of the Course **O. 6681**	**ADD – ON CERTIFICATE COURSE IN TECHNOLOGICAL SKILLS IN 21ST CENTURY**
2	Eligibility for Admission **O. 6682**	XII or equivalent
3	Passing Marks **R - 9424**	40
4	Ordinances / Regulations (if any)	
5	No. of Years / Semesters **R - 9425**	1 Semester (/30 hours)
6	Level	~~P.G. / U.G./~~ ~~Diploma~~ / Certificate **(Strike out which is not applicable)**
7	Pattern	~~Yearly~~ / Semester **(Strike out which is not applicable)**
8	Status	New / ~~Revised~~ **(Strike out which is not applicable)**
9	To be implemented from Academic Year	From Academic Year 2022-23

Name & Signature of BOS Chairperson : **Dr. (Mrs.) Geeta Ibrahim**

Name & Signature of Dean: _____

ADD – ON CERTIFICATE COURSE IN TECHNOLOGICAL SKILLS IN 21ST CENTURY

Type of Course: Add-on Certificate Course

Duration of Course: Total 30 hours

Mode of instruction: Offline and online

Experts will be called from outside and linkages and networks will be tapped for inviting resource persons involving participant learning.

Vision: Technology is shaping the world and can provide a wide spectrum in career opportunities. This course is for learners with sense of creativity and can be applied across different fields of study, hence it has a wide cross-curricular approach. The course aims to promote an awareness of the changing and progressive nature of technology. It will provide opportunities for students to apply and refine design approaches providing a viable solution.

Mission: This course aims to provide a technical platform to the eager minds to build knowledge and gain hands on experience in the field of robotics and coding which has gained attention over the last decade in various fields.

Objectives:
1. To enable the learners to design robotic creation and specific programs for handling various inputs and outputs in real time.
2. To provide knowledge and ideas on the latest developments in the field of robotics and automation.
3. To help identify future research needs in the interdisciplinary research fields.
4. To strengthen analytical thinking, design skills and computational thinking enabling students to develop games and apps.

Eligibility: XII or equivalent

Intake capacity: Minimum 10 students per batch

Credits: 2 credits

Fees for the course: Rs 3500/- (+ GST Applicable) per student

Honorarium: Rs. 750/- per hour for Practical and Theory

Coordinator fees for academic year/course: Rs. 5,000/- entire course

SYLLABUS

Preamble to the Course

- Technology is shaping the world and can provide a wide spectrum in career opportunities. This course is for learners with sense of creativity and can be applied across different fields of study, hence it has a wide cross-curricular approach. The course aims to promote an awareness of the changing and progressive nature of technology. It will provide opportunities for students to apply and refine design approaches providing a viable solution.

Title of the Course	Total Hours	Marks allotted	Credits for the Course
Technological Skills in 21st Century (comprising of three modules as detailed below)	**30**	**100**	**2**

Module No./Title	No. of Hours
Module I - Robotics	06
Module II - Coding	06
Module III - Project / Practical	18

Module I - Robotics

Objectives:

- To understand the basic concepts associated with the design and functioning and applications of robots
- To acquire the knowledge on robotics tools for the description of motion
- To develop an ability to use software tools for analysis and design of robotic systems

Unit	Course Content	Hours
I	• Introduction to robotics • Overview of different types of robots • History of robotics	1
II	• Components of robots: sensors, actuators, brain & power supply	1

	• Types of sensors, operation and application	
III	• Types of motors and actuators • Human – machine interaction • Feedback for control, speed, balance, temperature and damping oscillations for robots	2
IV	• Simple mathematical modelling of robots • Form of control strategies	1
V	• Robot interaction • Robot learning by trial and error • Robots and artificial life, relating to biological processes	1

Module II - Coding
Objectives:

- To develop their understanding of how computer and technology works
- To create and edit sequences of instructions
- To use computer to create simple programs
- To use aspects of computational thinking to complete goal objectives

Unit	Course Content	Hours
I	• Basics of computer programming • Working of Computers • Basic concepts in programming	2
II	Computer programming languages • Java • C • C++ • Python	2
III	Application of programming • Web design • App development • Create a game • Animation • Cyber security • YouTube channel	2

Module III - Project / Practical

Objective:

- To provide hands on experience with game / app development

Unit	Course Content	Hours
1	Project/Practical experience comprising of- • Ideation of game / app development • Market research • Layout of flow / features • Create mock-ups of game / app • Introduction of game / app	18

References for Module I, Module II and Module III:

- T-Shirt Automations – https://www.youtube.com/watch?v=xbkOTg0lqhY&feature=youtu.be
- Softwear Automation – • https://www.youtube.com/watch?v=zEgQHLTcI5k
- Can Robots Transform the Garment Industry – https://www.youtube.com/watch?v=BA96-WX-oXc&feature=youtu.be
- Robot sewing machine – • https://www.youtube.com/watch?v=_i4cfQGe8fY&t=6s
- Robot Sewing from Sewbo – • https://www.youtube.com/watch?v=sjjzo3c7b_8
- Sewing Robot - • https://www.youtube.com/watch?v=xrudo-ckSNU
- The Robot Revolution: Automation Comes into Fashion – • https://www.youtube.com/watch?v=OsSDI8wWAyQ
- https://www.researchgate.net/publication/233895854_Automated_Garment_Assembly_and_Manufacturing_Simulation
- https://www.fastcodesign.com/3064001/meet-the-garment-sewing-robot-that-could-disrupt-the-fashion-industry
- http://www.deviceplus.com/connect/sewbot-in-the-clothing-manufacturing-industry/
- https://www.fastcompany.com/40454692/this-t-shirt-sewing-robot-could-radically-shift-the-apparel-industry
- https://www.geekwire.com/2017/fashion-focused-amazon-wins-patent-demand-apparel-manufacturing/
- http://softwearautomation.com/digital-t-shirt-workline/
- http://www.fibre2fashion.com/industry-article/7183/use-of-robots-automation-in-the-garment-industry
- https://www.lifung.com/press-release/li-fung-accelerates-creation-digital-supply-chain-softwear-automation-partnership/
- https://sourcingjournal.com/topics/technology/softwear-automation-avery-dennison-apparel-manufacturing106632-106632/
- https://www.trtworld.com/magazine/will-robots-completely-replace-humans-from-textile-factory-floors--14930
- http://softwearautomation.com/digital-t-shirt-workline/#form_bottom References – Articles and Websites
- https://www.academia.edu/7614887/Robotics_Course_Outline
- https://www.futurelearn.com/courses/begin-robotics, University of Reading

Mode of assessment & evaluation for the course:

- Regular internal assignments and project work will be given by the concerned faculty and will have 40% weightage. It may include assignments, class tests, case studies or project work.
- The term end examination shall have 60% weightage and will be conducted by the concerned faculty.