UNIVERSITA' DEGLI STUDI DI MILANO BICOCCA

UNIVERSITY OF MILANO - BICOCCA

"GIUSEPPE OCCHIALINI" DEPARTMENT OF PHYSICS

MASTER'S DEGREE COURSE IN ASTROPHYSICS AND SPACE PHYSICS

(CLASS LM-58)

ANNUAL STUDY PLAN FOR THE 2023/2024 ACADEMIC YEAR

The following tables show the courses and educational activities to be offered in the 2023/2024 academic year.

YEAR I
(for students who enrol in the 2023/2024 academic year - Academic regulations applicable to the 2023/2024 academic year)

Mandatory core subjects (36 credits):

Educational activity type	Disciplinary area	Code	lessons	Credits	Scientific Disciplinary Sector	Semester
Core Courses	Astronomical - experimental observational	F5802Q001	LABORATORY OF DATA ANALYSIS	6	FIS/05	II
		F5802Q002	STELLAR ASTROPHYSICS	8	FIS/05	I
	Astronomical-Theoretical	F5802Q021	DYNAMICS OF STELLAR SYSTEMS	8	FIS/05	II
		F5802Q004	INTRODUCTION TO COSMOLOGY	6	FIS/05	I
		F5802Q003	RELATIVISTIC ASTROPHYSICS	8	FIS/05	I

The student must acquire 12 credits by choosing two core courses from among the following:

Educational activity type	Disciplinary area	Code	lessons	Credits	Scientific Disciplinary Sector	Semester
Core Courses	Astronomical-technological	F5802Q010	ASTRONOMICAL INSTRUMENTATION	6	FIS/05	II
		F5802Q008	ASTROPHYSICS OF GRAVITATIONAL WAVES	6	FIS/05	II
		F5802Q007	COSMIC STRUCTURE FORMATION	6	FIS/05	I
		F5802Q009	EXPERIMENTAL COSMOLOGY	6	FIS/05	II
		F5802Q006	LABORATORY OF DATA ACQUISITION	6	FIS/05	I

The student must acquire 12 credits to be chosen among the following related or supplementary courses:

Educational activity type	Disciplinary area	Code	lessons	Credits	Scientific Disciplinary Sector	Semester
Related/Integrative	Related or supplementary educational activities	F5802Q020	ASTROSTATISTICS AND MACHINE LEARNING	6	FIS/05	II
		F5802Q013	COSMIC RAYS	6	FIS/01	II
		F5802Q022	MODERN COSMOLOGY AND GALAXY FORMATION	6	FIS/05	II
		F5802Q015	NUMERICAL RELATIVITY	6	FIS/02	II
		F5802Q011	RADIATIVE PROCESSES	6	FIS/05	I

YEAR II
(for students who enrol in the 2022/2023 academic year - Academic regulations applicable to the 2022/2023 academic year)

Mandatory activities

Code	Activities	Credits
	ACTIVITIES CHOSEN BY THE STUDENT	12
	ADDITIONAL EDUCATIONAL ACTIVITIES	3
F5802Q016	MASTER THESIS	45

In compiling their study plan, students must comply with the Regulations for their particular year of enrolment, which can be found at the link: https://elearning.unimib.it/mod/page/view.php?id=752696

ENROLMENT IN THE COURSE OF STUDY

In order to be admitted to the Master's Degree Course in Astrophysics and Space Physics it is necessary to have a university degree or a three-year university diploma, or a qualification obtained abroad that is recognised as suitable. The curricular requirements are: a degree in the L-30 class or at least 18 credits in the scientific disciplines MAT/01-MAT/09 and at least 18 credits in the scientific disciplines FIS/01-FIS/08 or equivalent for foreign students. Once the curricular requirements have been verified, admission to the Master's Degree Course in Astrophysics and Space Physics is conditional on the assessment of the adequacy of the student's personal preparation, through an interview before a Committee.
Applicants who do not hold a Bachelor's degree in Physics are invited to contact the Master's Degree in Astrophysics and Space Physics Contact Person prior to the admission interview in order to agree on how to acquire the necessary qualifications for admission.
Unless the candidate's curriculum reflects sufficient introductory preparation in Quantum Mechanics, which may also be acquired by attending single courses and passing relative exams, the candidate's aptitude will be assessed during their in-person interview, which will cover the topics appearing on the list linked below:
https://elearning.unimib.it/pluginfile.php/1118996/mod_resource/content/2/Topics_QM_Admission_LM_Astro.pdf

Course admission also requires at least a B2 level of knowledge of the English language. The requirement for English language knowledge will be considered satisfied if the candidate:
a) has certification, recognised by the University, issued by an accredited Body, equivalent to level B2;
b) has passed an exam of at least 4 credits during previous university studies in one of the Scientific and Disciplinary Sectors between L-LIN/10, L-LIN/11, L-LIN/12;
c) has obtained the open badge Bbetween English B2 of the University of Milano-Bicocca;
d) has completed a degree course entirely or almost entirely taught in the English language.

For those who live more than 100 km from the University or who are away from home for documented study activities, the Committee may, on request, provide the opportunity to conduct the interview in teleconference.

The dates and procedure for the interviews and any required written exams are posted to the University's web page dedicated to the Master's Degree Course in Astrophysics and Space Physics https://www.unimib.it/graduate/astrophysics-and-space-physics

Further information is published on the e-learning website of the Course of Study: https://elearning.unimib.it/course/view.php?id=39343&lang=en

PART-TIME ENROLMENT

As an alternative to full-time enrolment, the student may enrol part-time according to the procedures defined in Article 10 of the Student Regulations available at
https://www.unimib.it/sites/default/files/allegati/regolamento_studenti_2019_con_decreto.pdf

RECOGNITION OF CREDITS AND TRANSFER PROCEDURES

The recognition of credits acquired in educational activities carried out in other courses at this or at other Universities (with no limit to the number of credits to be recognised; for courses belonging to the same class there is a regulatory limit of 50% of credits to be recognised) is subject to the approval of the Physics and Astrophysics Teaching Coordination Council as proposed by the Study Plan Committee appointed by the latter.

According to the Ministerial Decree 270/2004 and Law 240/2010, Universities may recognise as university credits individually certified professional knowledge and skills in accordance with the relevant regulations, as well as other knowledge and skills acquired in post-secondary activities in which the university has contributed to the design and implementation, up to a maximum of 12 credits, between undergraduate and postgraduate courses in total. This recognition is subject to approval by the Physics and Astrophysics Teaching Coordination Council.
Information on how to submit transfer applications is published at the website: https://www.unimib.it/servizi/segreterie-studenti/passaggi-trasferimenti-e-rinunce

REGISTRATION FOR YEARS SUBSEQUENT TO THE FIRST YEAR

For information on registration for years subsequent to the first year please see the website:
https://www.unimib.it/servizi/segreterie-studenti/rinnova-liscrizione

CLASS SCHEDULE

Classes for the **first semester** will be held between **2 October 2023 and 26 January 2024**
Classes for the **second semester** will be held between **4 March 2024 and 21 June 2024**

Class schedules will be posted on the website:
https://gestioneorari.didattica.unimib.it/PortaleStudentiUnimib/

TEACHING PROGRAMMES

The teaching programmes (Syllabus) are available on the University e-learning platform at the following link:
https://elearning.unimib.it/course/index.php?categoryid=7450

ELECTIVE COURSES

There are 12 credits for educational activities chosen by the student *(Decree no. 270 of 22 October 2004, Art. 10 paragraph 5 letter a)* as long as they are consistent with the educational programme. The student can choose among all the educational activities offered in the Master's degree courses at the University.
Repetitions of courses already taken in the Bachelor's degree course, or which present significant overlaps in content, are not permitted.

ADDITIONAL EDUCATIONAL ACTIVITIES

The acquisition of 3 credits relating to "Further educational activities" takes place according to the procedures specified below.

ITALIAN students may choose between:
- 3 Credits of additional skills useful for the world of work gained by participating in the University's I-Bicocca project activities (I-Bicocca Silver, 1 credit; I-Bicocca Gold, 2 credits; I-Bicocca Platinum, 3 credits)
or
- 3 Credits of additional linguistic skills are gained by passing a University B2 foreign language assessment in a language other than English, choosing from French, Spanish or German, or by passing a C1 level University English language assessment.
Italian students who already hold certificates issued by the University or by Bodies accredited by the University attesting to language skills at a level equal to or higher than B2 for French, Spanish or German, or C1 or higher for English, will be exempt from the test and awarded the required credits.

Foreign students, on the other hand, must obtain 3 credits of additional linguistic knowledge, by passing a University test of knowledge of the Italian language, level A2.
Foreign students who already hold certificates issued by the University or by Bodies accredited by the University attesting to their language skills, with a level equal to or higher than A2, will be exempt from the test and awarded the required credits.
Information on how to take assessments or acquire credits is provided by the University and available on the University's website at https://www.unimib.it/didattica/lingue-unimib."

SUPERNUMERARY CREDITS (Academic Senate resolution 11 May 2020)

By way of derogation from the provisions of Article 22, paragraph 3) of the University Teaching Regulations in force, the Academic Senate, by resolution of 11 May 2020, has provided, also for students enrolled in Master's degree courses, the possibility of including in their study plan supernumerary activities up to 16 credits, starting from the 2019/2020 academic year.
The 16 supernumerary credits can be acquired through the accreditation of exams taken for teaching purposes, in Erasmus or through transversal activities offered by the University.
Credits and marks obtained for additional teaching are not included in the calculation for the grade point average of the proficiency exams, but are recorded in the career and will be reported in the Diploma Supplement.

EXAMS

Exams may be written and/or oral. Laboratory lessons may also include practical tests. Attendance of at least 75% of the course is required for laboratory courses.
Teachers may provide for subsequent tests, including written tests, to be concluded with a final check. For the specific examination procedures adopted for each course, see the Course of Study page https://elearning.unimib.it/course/index.php?categoryid=7450&lang=en
Students can enrol to final exams through the online Secretariats:
https://s3w.si.unimib.it/Home.do;jsessionid=41E3EE425F1E009622B09AFD504368E3.esse3-unimib-prod-02?cod_lingua=eng
The Exam Session Board https://s3w.si.unimib.it/ListaAppelliOfferta.do?will show the exam sessions for each activity, Degree Course or Department.

PRESENTATION OF THE STUDY PLAN

The study plan is the set of mandatory educational activities, the activities provided as elective extras and the educational activities chosen independently by the student in accordance with the course teaching regulations.
When enrolling for the first year, the student is automatically allocated a study plan, which constitutes the statutory study plan.
Subsequently, the student must present his/her own study plan with indication of the elective and chosen activities according to the times and procedures provided by the academic bodies; the study plan presented by the student must obtain the approval of the Physics and Astrophysics Teaching Coordination Council.
The student's right to take tests related to a type of course is subject to the presence of the activity in the last approved study plan.
Please refer to the University Regulations for Students for anything not listed on this page
https://www.unimib.it/sites/default/files/allegati/regolamento_studenti_2019_con_decreto.pdf
The methods and deadlines for submitting the study plan are defined by the University.
More information will be posted on the website: https://www.unimib.it/servizi/segreterie-studenti/piani-degli-studi/area-scienze

FINAL EXAM

Master's thesis in Astrophysics and Space Physics (Master's Thesis 45 credits)

The student must have acquired at least 75 credits to be admitted to the final exam.

The final exam consists of a thesis written in an original way by the student under the guidance of a supervisor. The discussion of the thesis will take place in front of a Committee appointed by the President of the School of Science. The thesis must be written in English. The discussion will be conducted in English. The final grade will be conferred taking into account the candidate's academic career and the Supervisor and Committee's opinion, according to the criteria decided by the Physics and Astrophysics Teaching Coordination Council.
The assessment procedures are explained in the final exam regulation approved by the Physics and Astrophysics Teaching Coordination Council and available at the following link: https://elearning.unimib.it/mod/page/view.php?id=861547
Please refer to the Course of Study e-learning website to consult the calendar of graduation sessions: https://elearning.unimib.it/course/view.php?id=39341&lang=en

CONTACT DETAILS

Course Location: “G. Occhialini” department of Physics, Piazza della Scienza 3, 20126 Milan, Italy.

Chair of the Physics and Astrophysics Teaching Coordination Council: Professor Maddalena Collini

Course contact person: Professor Sebastiano Cantalupo

Subject contact people:
Astrophysics - Professor Monica Colpi
Biophysics - Professor Giuseppe Chirico
Electronics - Professor Andrea Baschirotto
Applied Physics - Professor Luca Gironi
Particle Physics - Professor Pietro Govoni
Plasma Physics - Professor Claudia Riccardi
Solid State Physics - Professor Marco Bernasconi
Theoretical Physics - Professor Carlo Oleari

Teaching secretariat: Dr. Maria Grazia Perrone
phone +39 02 6448 4080, e-mail didattica.fisica@unimib.it

The Physics Department website dedicated to the Course of Study:
https://www.fisica.unimib.it/en/teaching/degree-courses/master-astrophysics-and-space-physics-new-course-english

Course of study e-learning site: https://elearning.unimib.it/course/index.php?categoryid=7449

For all information not contained in this document, please refer to the reference teaching regulations which can be consulted at https://elearning.unimib.it/mod/page/view.php?id=752696