



*European
Polytechnical
University*

23 Sv. Sv. Kiril and Metodiy Str.
2300 Pernik, Bulgaria
Tel. 00359 898751012

ENDORSED:

Rector of EPU: Prof. D-r Marin Marinov

„MASTER “ degree

Form of teaching: *full-time*

Duration of the programme: *1,5 years*

Professional qualification: Master

PROFESSIONAL DIRECTION: 5.4. ENERGETICS

C U R R I C U L U M

OF THE SPECIALITY: HYDROGEN TECHNOLOGIES (HyTech)

2019

PERNIK

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I. TIME SCHEDULE

Semester	Auditoria Workload	Examinations	Practical Training	Industrial/Field Placement	Practice	Work on Diploma Thesis	Vacations	Total (Number of Weeks)
I	330	4	-	-	-	-	11	25
II	345	5	-	-	-	5	5	25
III	270	2					5	25

II. CURRICULUM

ECTS code: Hy Tech TNo

- Hy Tech – “Hydrogen technologies“
- T – type of degree: **B** – „Bachelor“, **M** – „Master“;
- No – serial number of the course;

Lectures (L), Seminar Exercises (SE), Lab Exercises (LE), Practical Training/Fieldwork (PT), Auditoria Workload (total) (AT), Self-Study (SS) per week

Exam (E), Continuous Assessment (CA); Project Work (PW), Coursework (CW), Course Tasks (CT),

COURSE STRUCTURE (MASTER –HYDROGEN TECHNOLOGIES)

Lectures (L), seminars (S), laboratory work (LW)

First Semester

N°	Subject	Signature	L	S	LW	Auditorium Total	Self- training	Total	Assessment	Credits
1	Technologies for hydrogen production	HyTech1	2	1	0	3	3	6	examination	5

2	Hydrogen engineering (production, storage, distribution, safety).	HyTech2	2	1	0	3	3	6	continuous assessments	5
3	Hydrogen Fuel Cell Technology.	HyTech3	2	1	1	4	4	8	examination	5
4	Project theme: Modelling and optimisation of fuel cell systems.	HyTech4	2	1	1	4	4	8	Course project	5
5	Introduction to Fuel Cells: - Status and applications of fuel cell technology.	HyTech5	2	1	1	4	4	8	examination	5
6	Elective 1.	HyTech6	2	1	1	4	4	8	examination	5
	Total		12	6	4	22	22	44		30

Elective courses

1-1	Fuel Cell Basics and Types	HyTech106-1
1-2	Fueling the Hydrogen Fuel cell	HyTech106-2
1-3	Hydrogen safety threats, principles of mitigation, regulations, standards	HyTech106-3

Second Semester

N°	Subject	Signature	L	S	LW	Auditorium Total	Self- training	Total	Assessment	Credits
7	Basic Thermodynamics and System Analysis for Fuel Cells.	HyTech 7	2	1	0	3	4	7	continuous assessments	5
8	Fuel cell hybrid electric vehicles.	HyTech 8	2	1	1	4	5	9	examination	5
9	Proton exchange membrane (PEM) fuel cell.	HyTech 9	2	2	0	4	4	8	examination	5
10	Engineering Photosynthesis for H ₂ Production from H ₂ O.	HyTech 10	2	1	1	4	5	9	examination	5
11	Hybrid Systems.	HyTech 11	1	2	0	3	3	6	examination	5
12	Elective 2 (project).	HyTech 12	1	4	0	5	5	10	Course project	5
	Total		10	11	2	23	26	48		30

Elective courses

2-1	Competing technologies & the market place	HyTech12-1
2-2	Hydrogen Storage Technologies	HyTech12-2
2-3	High Temperature Proton Exchange Fuel Cells: Materials, Experiences, Challenges	HyTech12-3

Third Semester

N ^o	Subject	Signature	L	S	L W	Auditorium Total	Self- trainin g	Tota l	Assessmen t	Credit s
13	Thesis.	HyTech1 3	0	0	10	10	23	33	defence	20
14	Energy Economic s Focused on Hydrogen.	HyTech1 4	0	3	0	3	6	9	continuous assessment s	5
15	Elective 3	HyTech1 5	1	4	0	5	4	9		5
	Total		1	7	10	18	33	51		30

Elective courses

3-1	Design and construction of an ethanol based laboratory fuel cell system	HyTech15-1
3-2	Development of a fuel cell based automobile- base principles	HyTech15-2
3-3	Advanced process integration of fuel cell systems	HyTech15-3

III. BASIC PARAMETERS OF THE CURRICULUM

Semester	Weekly Workload							Semester Workload				Control			
	L	SE	LE	PT	AT	SS	Total	L	SE	LE	PT	E	PW	CP	CT
I	12	6	4	-	22	31	53	180	90	60	-	4	1	0	0
II	10	11	2	-	23	30	53	150	165	30	-	5	1	0	0
III	1	7	10	-	18	33	51	15	105	150	-	2	1	1	0
Total	23	24	16	-	63	94	157	345	360	240	-	11	3	1	0

1. Duration of the programme (Срок на обучение) - 1,5 years, 3 semesters

2. Auditorium work load according to the curriculum

Total – 945 teaching hours .

In details:

Lectures - 345 teaching hours

Seminars – 360 teaching hours

Laboratory work - 240 teaching hours

Practice before the thesis – 15 teaching hours

3. Total number of subjects - 15

4. Control

4.1. Examinations - 11

4.2. Continuous assessments - 3

4.3. Course projects - 1

. 19.12.2017г.

Head of the Program Green Energetics:

Prof. Ivan Petkov, DSci



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