



Высшая
Инжиниринговая
Школа МИФИ



EDUCATION IN DIGITAL ENGINEERING: MEPHI CASE

15.05.2018

NEW EDUCATIONAL PRODUCTS AND TECHNOLOGIES DRIVEN BY MARKET DEMAND



ВШ
МИФИ

NEW SCHOOL OF INDUSTRIAL DIGITAL ENGINEERING



Higher Engineering School of MEPhI (in partnership with Atomstroyexport)

Masters programs on Digital technologies (Data Engineering, AI, IoT, IIoT, VR, AR, blockchain), Digital engineering, Design and operations of complex engineering systems in nuclear and non-nuclear industries

DIGITAL LEARNING ENVIRONMENT

VIRTUAL & ADJUSTED REALITY

- Nuclear plant operations
- 3D-visualizing for medical application
- Nuclear engineering and design
- Megascience network of research centers

70 MOOCS

10 VLS*

edX coursera

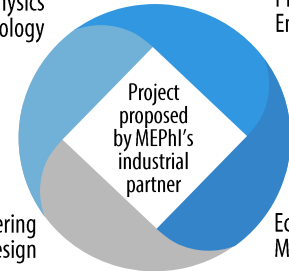
To be integrated into core curricula

*Virtual Laboratories

PROJECT-CENTERED EDUCATION

Nuclear Physics
& Technology

Program
Engineering



Engineering
& Design

Economics &
Management

EDUCATION BY DEMAND OF PHARMA INDUSTRY



The Learning Factory and Good Manufacturing Practice (GxP) Masters program (for Kaluga Pharmaceutical Cluster/AstraZeneca)

SOCIAL SCIENCE PROGRAMS IN NUCLEAR UNIVERSITY



Joint Masters program with Russian Foreign Trade Academy (Double Diploma)

Extended curriculum for future leaders
of economy and industry



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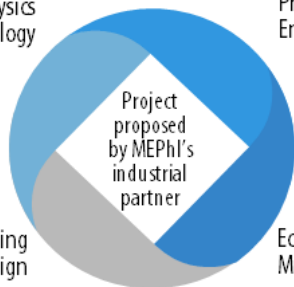
PROJECT-CENTERED EDUCATION

Nuclear Physics
& Technology

Program
Engineering

Engineering
& Design

Economics &
Management



IN "DIGITAL ECONOMY" PROGRAM

«NEW PRODUCTION TECHNOLOGIES»

«DIGITAL CONSTRUCTION»

TARGET MODEL

- HIGH STANDARD ENGINEERING EDUCATION
- TRAINING CENTER FOR DATA ENGINEERS IN THE INDUSTRY
- COOPERATION NETWORK CENTER FOR ENGINEERING EDUCATION (UNIVERSITIES AND INDUSTRY COOPERATION)
- R&D-TESTBEDS FOR NEW MARKETS
- CENTER OF INCUBATION OF NEW TECHNOLOGIES FOR ENGINEERING COMPANIES (ASE)
- CENTER FOR RETRAINING AND CONTINUING EDUCATION FOR CLIENTS AND PARTNERS OF ROSATOM SC

«NEW PRODUCTION TECHNOLOGIES»

«DIGITAL CONSTRUCTION»

MASTER SCHOOLS

SYSTEM ENGINEERING OF COMPLEX TECHNOLOGICAL OBJECTS. DIGITAL PLATFORMS

DATA ASE (ANALYTICS, SCIENCE, ENGINEERING)

DATA SECURITY ASE (ANALYTICS, SCIENCE, ENGINEERING)

ON-LINE MASTER SCHOOL
DATA SECURITY ASE

FACULTY STAFF RETRAINING

DATA ASE T³ (TRAIN-THE-TRAINERS)

DATA SECURITY ASE T³ (TRAIN-THE-TRAINERS)

RETRAINING AND CONTINUING EDUCATION

DATA ASE СЕРТИФИКАЦИЯ

DATA SECURITY ASE СЕРТИФИКАЦИЯ

ON-LINE СЕРТИФИКАЦИЯ
DATA SECURITY ASE

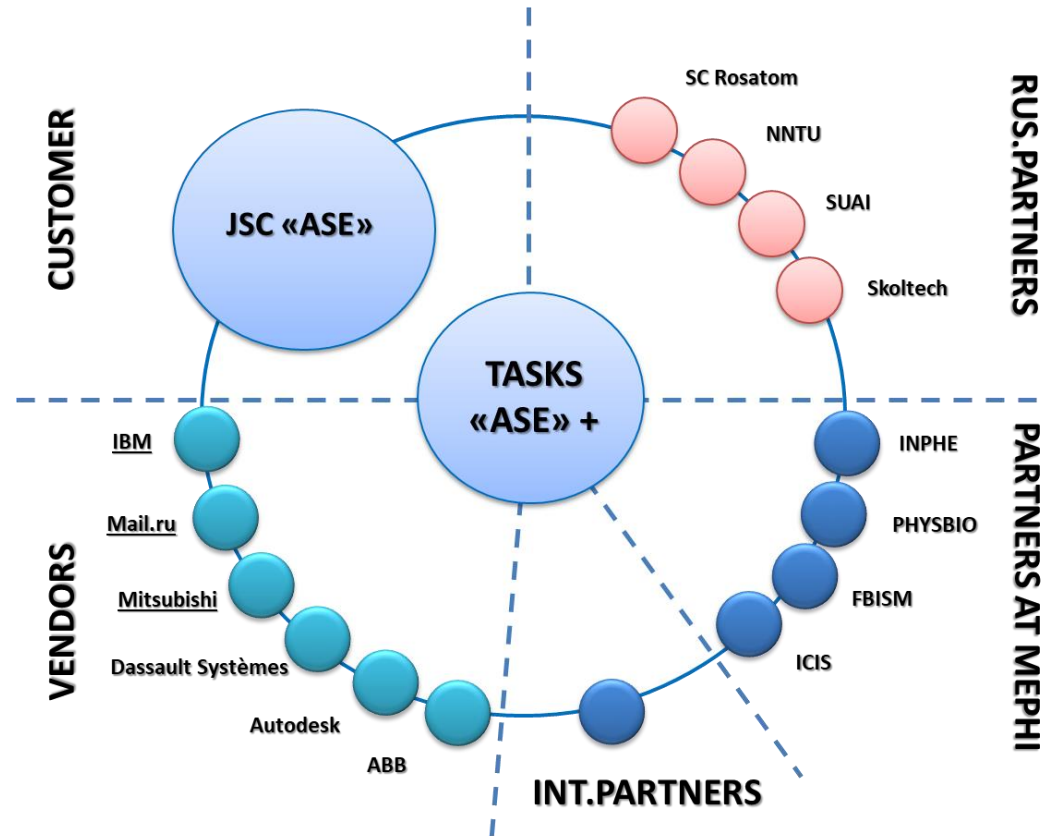
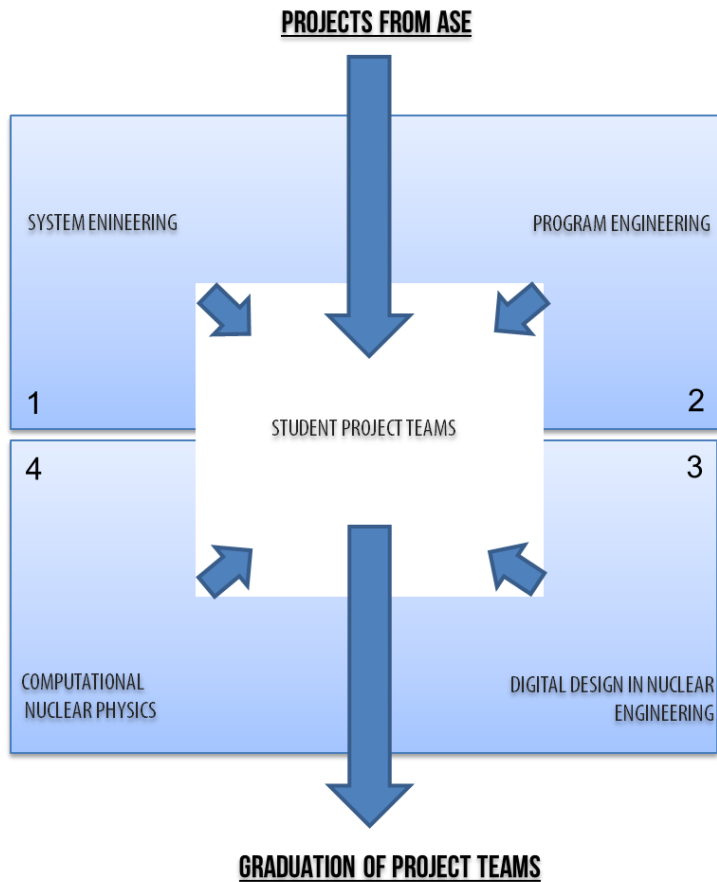
DIGITAL EDUCATION
ENVIRONMENTS

DIGITAL PROJECT PLATFORMS

BASIC PRINCIPLES OF PROGRAMS OF HES MEPHI . PROJECT TEAMS FORMATION

ALL TRAINING IS ON THE BASIS OF THE REAL PROJECTS OF INDUSTRIAL PARTNERS WITH THEIR DIRECT PARTICIPATION AS TEACHERS/MENTORS

INVOLVEMENT OF LEADING ACADEMIC EXPERTS (INNER AND EXTERNAL) AND DEVELOPERS OF DIGITAL SOLUTIONS IN THE PROCESS OF TRAINING



SYSTEM ENGINEERING OF COMPLEX TECHNOLOGICAL OBJECTS. DIGITAL PLATFORMS. PILOT ADMISSIONS 2017



Инженеры цифрового будущего

ВЫСШАЯ ИНЖИНИРИНГОВАЯ ШКОЛА (ВИШ) МИФИ

Совместный проект НИЯУ МИФИ и Группы компаний ASE

Подписание соглашения о сотрудничестве между НИЯУ МИФИ и Группой компаний ASE 20 июня 2017г.

Portraits of students: Александр Зибачев, Екатерина Осипова, Николай Дубинин, Александр Петров, Павел Талочин, Ольга Рыбачева, Ольга Хорькова, Алексей Демин, Валерий Шаронов, Юрий Жуковский, Руслан Юрбанов, Евгений Валюцкий.

Logos: ASE-ASE, МФИ.

COOPERATION AGREEMENT MEPHI-ASE (JUNE,2017)

PROGRAM START

SEPT 2017

PROGRAM STAGES

- 1 STAGE 2017 - 20 STUDENTS
- 2 STAGE 2018 - 40 STUDENTS

TRAINING DIRECTIONS

- 14.04.02
- 09.04.04
- 27.04.03

EDUCATIONAL PROGRAM FORMATION

1. CORE CURRICULUM FOR EACH OF THE EDUCATIONAL PROGRAMS
2. CROSSCUTTING COURSES
3. JOINT PROJECT TEAMS (1 TEAM=4 STUDENTS FROM EACH OF THE PROGRAMS)

PROGRAM SCALING

- MASTER SCHOOL: 150-200 STUDENTS
- RETRAINING : 300 PERS/YEAR

MEPHI vs ASE

- JOINT EFFORTS IN CURRICULAR DEVELOPMENT
- ASE PROVIDES MENTORS/EXPERT LECTURES
- STUDENTS ARE GET EMPLOYED BY ASE

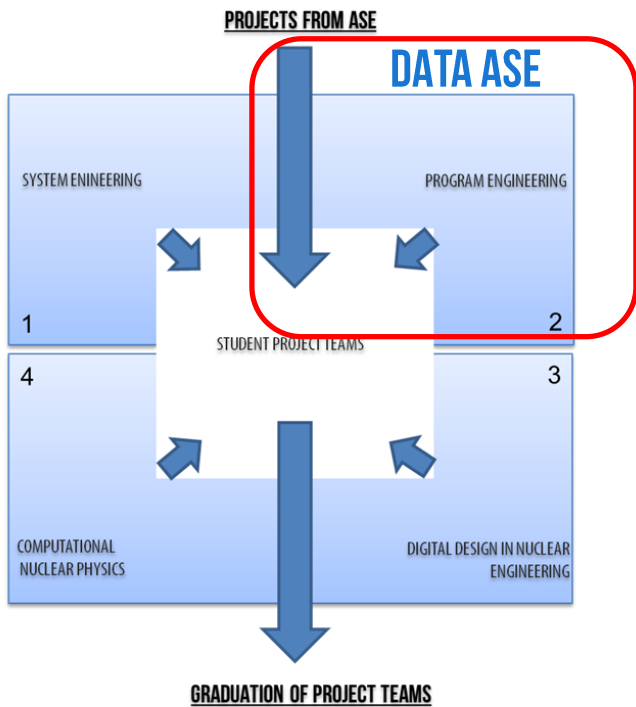
STUDENT PROJECTS 2017-2018

EXAMPLES



- 1 Development and implementation of an integration solution between the calculation complex "Implementation of thermal hydraulic calculations of heat networks - Zulu Thermo" and the information model of nuclear power plants (**Mentor – Maksim Zhelnov**)
- 2 Development and implementation of the digital solution "Settlement Complex of Room Ventilation Systems" and its integration with the data storage system (**Mentor – Eugeny Chebotarev**)
- 3 Development and implementation of an integration solution between the calculation complex "Strength calculation of pipelines of nuclear power plants and TPPs - dPIPE", "Engineering data management system - SmartPlant Foundation" and "3D SmartPlant 3D System" (**Наставник – Andrey Sankov**)
- 4 Development and implementation of an integration solution between the calculation complex "Calculation of non-stationary temperature stresses of pipelines - RTNT" and the information model of nuclear power plants (**Mentor – Dmitry Akulov**)
- 5 Development of an integration solution between the E3 Series computer-aided design system and the ETAP complex for the calculation of short-circuit currents (**Mentor – Alexander Shamanin**)

DATA ASE (DATA ENGINEERING) PILOT RUN 2018



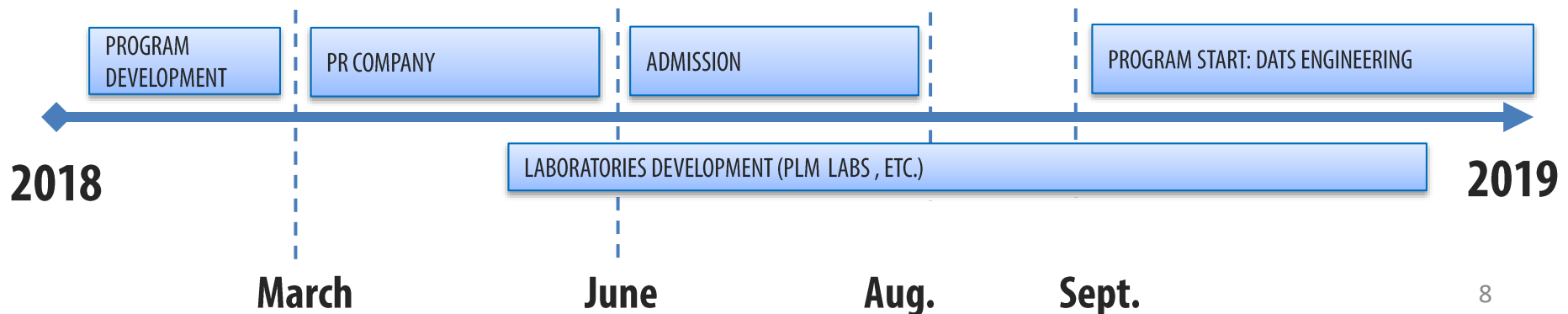
DATA ASE SUBJECTS

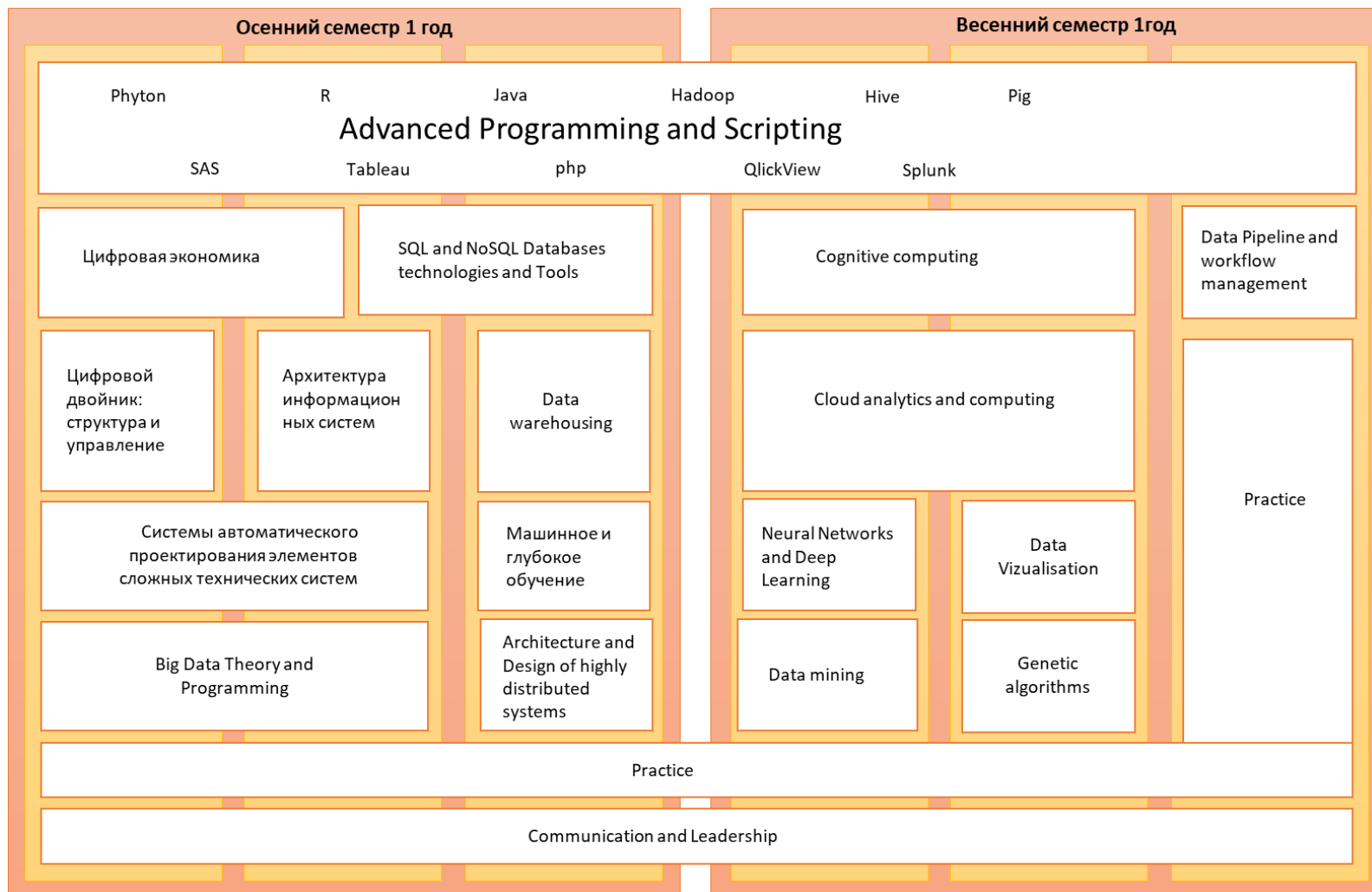
- Digital tweens
- Lifetime of complex technological objects
- Smart city
- Smart medical services

DATA ASE PARTNERS WE SEE

- ASE , Rosatom, Siemens, Mail.ru, Сколтех
- ASE , Mail.ru, ABB, МГСУ, NNTU
- ASE, Rosatom, NNTU, SUAI
- Rosatom, MTS, SUAI, IBM

ПРИНЦИП: модульность программ
обучение на платформах ведущих ИТ вендоров





ИНЖЕНЕРЫ БУДУЩЕГО ДЛЯ ЦИФРОВОЙ ЭКОНОМИКИ

Для решения поставленных в рамках учебного, научного и инновационного процессов задач обучающимся потребуется не только показать высокую профессиональную компетенцию, но и продемонстрировать свои, так называемые, мягкие навыки (командная работа, тайм-менеджмент, умение вести диалог и т.д.)



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ВЫСШАЯ ИНЖИНИРИНГОВАЯ ШКОЛА НИЯУ МИФИ