National Research University Higher School of Economics
Institute for Statistical Studies and Economics of Knowledge

Master Program (MP)
Governance of Science, Technology and Innovation

General characteristics of the MP

Through the unique combination of teaching courses with a strong scientific orientation in research seminars and practical application of problems defined in the internship program students receive competences for solving multi facet challenges in the field of science, technology and innovation (STI). The program involves one stream on STI policy for policy making professionals and one stream on STI management for companies and research organizations' affiliated professionals. This unique combination provides students with the possibility to choose either stream for targeted specialized education.

The program's faculty consists of the leading HSE tutors, ISSEK senior researchers and teachers, including senior researchers of the international laboratories "Economics of Innovation" and "Science and Technology Studies" and highly reputed foreign scholars from partner universities as well as from reputed international organizations and practitioners from industry and government bodies. The curriculum is designed to allow students to study while working. Courses will be given in the evening hours and Saturdays not exceeding 16 academic hours per week. Lectures and seminar work is accompanied by an internship element in which students are expected to apply the knowledge they gained in the teaching exercises. The program is full of science and research practice, cases, self-making projects, circular tables and practical discussions and enables students to fully adapt to strict reality of contemporary STI business and receive a competitive advantage inside the Russian and foreign employment space.

The program mission is to develop combined science, technology and innovation policy and management skills, personal and creative potential for bachelor or specialist in management, economics, engineering or natural sciences. The program aims at training students as highly professional coordinators and managers of STI at policy and operational level, being ready to innovative activities both in public and private sectors, and to personnel pool production for the Russian and international institutions as well. The program is run by the Institute for Statistical Studies and Economics of Knowledge (ISSEK) in close cooperation with faculty from leading research institutions and international organizations worldwide like University of Manchester, Ottawa University, Organisation for Economic Co-operation and Development (OECD).These institutions have been active in STI related research, teaching and consulting for more than one decade each and OECD is considered the institution which is setting global standards for STI and possesses the largest inventory of STI policies of OECD member countries. Foreign lecturers come from universities which are often among the top 50 universities worldwide in different rankings.

The teaching language of the program is English. Courses teach the students theoretical and conceptual knowledge complemented by the practical applicability of the knowledge.

From the inception of the MP the involvement of international partner institutions was intended. So far several agreements on students' exchange and dual degree programs with a number of European and Asian Universities have been concluded.

The MP offers a significant number of tution-fee free places; some students are aimed to become self-paying students. Moreover, it is intended to attract international students to the program.

Relevance, goals and objectives of the MP

Science, technology and innovation (STI) are increasingly interdependent and interrelated. Managing STI at national level but also at corporate level has become a more complex and challenging task. The biggest challenge is to turn knowledge into application and to maintain the balance between converting knowledge into use and the generation of new knowledge. This is not an easy task especially since the available knowledge continues to grow at an ever higher speed and STI has become and continues to be a global phenomenon. To meet these future challenges and to turn these challenges into opportunities for countries and corporations STI professionals are in demand who have a systemic understanding of the different policy arenas, an integrated understanding of the interrelationship of different policy measures, an understanding of education and STI activities at the operational and the policy level. Furthermore these leaders have to have the competences to understand policy making and implementation enabling them to design policies which are more smoothly implemented and enabling them to take into account policies in their daily operations. Building, maintaining and refreshing these competences requires a holistic and systemic education for the next generation of policy makers, administrators, managers in the public and the private sector. Therefore the MP includes two dimensions in one Master program. Due to the different professional and educational background of students and the international openness and active exchange with partner universities the MP delivers multidisciplinary and multinational competences to students. People with such education are a scarce resource not only in Russia but globally.

The MP is unique in its shape by bringing experienced faculty together in a program which teaches STI policy and STI management. It includes courses which introduce the basics of STI – both operationally and at policy level and targeted elective courses on the major challenges in the respective fields. Complementary research seminars and internship at leading organizations enhance students' capabilities of scientific work and practical problem solutions.

The program brings together the views and knowledge of science, technology and innovation management and the policy view on science, technology and innovation to meet the programs goals of:

- enriching students professional skills
    - teach students necessary theoretical knowledge
    - train MP students' practical skills by looking at real cases
    - broaden students horizon beyond science or technology or innovation towards and integrated understanding
    - train MP students' problem solving skills and project management abilities
- creating a proper educational infrastructure which is necessary for training in this field, particularly for work with up-to-date international approaches and experiences by
    - combining theoretical education and practical experience
    - including international expertise and experience in the program
    - enriching students' personal characteristics; increasing their intellectual potential for innovative development of organizations and policy

The programs' objective is to train specialists to have up-to-date knowledge in coordination and management of STI in public service, private institutions and intermediary bodies (funding institutions).

To meet the high expectations on the Master Program several measures have been taken:

- Courses are designed to involve international guest lecturers.
- Faculty staff members are selected and recruited according to international standards.
- Initial discussions with international partner organizations have been started with the aim to develop substantial co-operations in the Master program.
- A working paper series STI has been established successfully by HSE ISSEK which will also be used for publication of outstanding students work. A depository of Master thesis by students will be established in the near time.

Target Audience of the MP

The MP aims at attracting Russian and international students holding bachelors or Masters' degree in natural science, engineering or social science. Possessing practical work experience from Russia or abroad would be advantageous. Students applying for the MP need to possess the following skills and competences

- Bachelor or specialist degree in engineering or natural sciences, management, economics, law, political science, sociology with above the average result. The preference will be given to engineering or natural sciences specialties
- Fluent English
- Self-organized and self-responsible problem solution
- Structural and analytical thinking capabilities
- Work experience at industry or public service is desirable but not obligatory

Students are expected to learn and work in multidisciplinary and international teams. This requires cultural openness of students from the very beginning and will be an asset for students in their subsequent career.

The admission of the Master program is determined by the Russian legislation and Rules for admission to Master's programs at the NRU HSE, and Supplements to Rules for admission to Master's program. To enter the MP applicants should submit their applications and pass an interview. The workload of the program is equal to 120 credits of the European Credit Transfer and Accumulation System (ECTS) for two years including all the lecture and independent students' work, workshop and time for exams.

Admission criteria are as follows:

- Bachelor's (Master's or Specialist's) degree
- Quality of the motivation letter for admission to the Master program
- A good command of English language both spoken and written (advanced or at least upper intermediate level)

Prospective students should apply in written form during the application period set by NRU HSE.

Applications for admission consist of

- letter of motivation in English
- previous diploma with all attachments
- curriculum vitae in English
- other documents about academic merits and personal achievements *(optional, not obligatory):*scientific published and reviewed works, articles, contributions, letters of recommendation, active contribution(s) to foreign language conferences/ seminars, receipt of scholarships/ grants valid international English certificates (obtained during the last 3 years).

Selection will be based on the merits of applicants from university studies and professional career achievements and a motivation letter in which applicants should state their reasons for applying to the program.

Students wishing to continue their profession during the MP are requested to inform their employer about the MP and obtain approval by the employer for attending the program with all related consequences. Students wishing to prepare Master thesis on a given practical theme are also required to make first proposal of potential topics for such Master thesis.

Admission selection is done in 3 steps:

1) Assessment of students admission documents.
2) Successful applicants will be invited for an interview. Interviews will be held during two last weeks of July. The objective of the interviews is to test language competences to assure that students can follow the program and contribute actively as well as discussing the motivations of applicants and the existing knowledge of the subject, analytical and structural thinking competences. Interviews will last 30 minutes and conducted by a commission of the MP director and at least 2 course directors.
3) Students will be informed about admission to the program at the end of July.

The entering to the Master course is on 1 October each year.

Global context

Science, Technology and Innovation are core activities for countries and corporations globally. Countries increasingly aim at achieving competitive advantages for the national economy through science which is considered the long term basis for technology and innovation. Though this is reasonable and plausible most countries are following isolated approaches in designing respective policies, e.g. in most cases policy measures are targeted at science or at technology or at innovation. There are few horizontal policy measures which take into account all three fields. The reasons are manifold; mainly this is due to the political constellations in countries and the influence of interest groups on policy measures design and implementation. While in many countries dedicated councils and expert commissions are established to produce and prepare seamless STI strategies for the countries it becomes obvious that these often lack the respective implementation. This is then also to some extend due to the education and training, hence the background, of people responsible for implementation and fine-tuning of policy measures. Furthermore, an increasing global competition for the attraction of foreign direct investment in STI by especially multinational companies is evolving. Here countries compete globally for foreign investments by offering numerous advantages to companies. At first sight this seems reasonable and plausible but national policy often neglects the fact that industry STI is as mobile as manufacturing. Thus corporations tend to take the advantages in one country, establish STI activities there and relocate facilities in due time taking advantage of incentives offered in other countries. To some extend this phenomenon can be assumed a consequence of the increasing transparency and communication of national STI policy measures which takes place in respective working parties at international level (OECD, UNESCO, UNCTAD, UNIDO), international public financial institutions (World Bank, IMF, EBRD, EIB, ADB, IADB etc.) which in many cases use similar development strategies for countries but also via internet platforms and databases (EU ProInno, OECD/World Bank Innovation Policy Platform). These channels have in common that policy measures and strategies are communicated and discussed but the specific framework conditions under which such measures might work are neglected. But it's common knowledge that STI policy measures need to be adjusted to the national and more important regional frameworks conditions. In addition such measures need to consider the special requirements for STI by industrial actors, specifics of innovation behavior by companies in different sectors and regions.

Globally there is a shortage of people in responsible positions who have the competences and knowledge to understand the innovation generation process at company level and the interaction with the policy domain as well as the question how the respective policies are embedded in the national and regional systems.

The NRU HSE MP program combines all these aspects in one program, hence STI policy and STI company management are taught to students to prepare them understanding of not only policy or corporate management but also to learn the impact and influence of regional and national characteristics on the policy and corporate management. The program employs a

balanced mix of Russian and international faculty, each bringing its own experiences and views in the program. Dedicated mandatory courses for all students are mainly given by the international faculty. The program also includes elective courses which are fully given by NRU HSE international faculty and invited foreign experts. Faculty staff has proven track record in teaching and also in practical work in the STI domain, each international faculty staff member has extensive experience in national STI, e.g. countries other than Russia, and international STI by membership or professional relationship with international or multinational STI related organizations. Russian faculty enriches the courses with a combination of basic theoretical understanding and the corresponding framework conditions in Russia. All courses are designed to be given by Russian and international faculty staff members jointly.

Comparative advantages of the MP

The Master program is unique in bringing the policy view and the corporate management views of science, technology and innovation in one program. Existing programs commonly focus on either the management or the policy dimension.

Institution	Master Program title	Main focus	HSE competitive advantage
MIT Sloan Management	MIT Sloan Fellows Program in Innovation and Global Leadership	• Corporate innovation focus	• Includes national innovation system and policy
MIT Sloan Management	Science in Management Studies	• Technological innovation & entrepreneurship	• includes social innovation and other types of innovation as well
Stanford University	Management Science and Engineering	• addresses critical technical and managerial needs in private and public decision making.	• Considers more systemic determinants of decision making
Harvard Graduate School	Technology, Innovation, and Education Program	• Creative design • potential of media and technology to transform educational policy and practice. • Research and evaluation	• Not focused on design and social media but included in case study work
Singapore University	Intellectual Property Management Management of Technology	• Focus on corporate aspects	• Includes these aspects under the overarching umbrella themes
Tsinghua University	Science and Technology Management Program	• Corporate management	• Included in HSE MP and complemented by national dimension
Eindhoven University of Technology (TU/e)	Innovation Sciences	• Focus on technological innovation • international, socio-economic and regulatory contexts	• systemic innovation are core • social innovation included, not limited to technological innovation
Wageningen University	Development and Rural Innovation	• Strong focus on regional development	• Beyond regional dimension, including corporate and national dimension
MCI Management	Innovation & Intellectual	• Corporate innovation and intellectual property only	• Explores on corporate innovation and IPR

Center Innsbruck	Property Rights		• Outs corporate innovation and IPR in broader context
ENSCBP - Bordeaux Institute of Technology	Master of Science	• Focus on technological innovations	• Includes technological innovation • Includes other forms of innovation
The University of Edinburgh	Science & Technology Policy & Management	• science, technology and innovation studies at policy level	• includes STI studies at policy and corporate level, broader scope
University of East London	Innovation Studies	• explores the complex, dynamic relations between social and technological forces shaping innovation processes in an international context	• includes the innovation process in corporate, regional, national and international dimension • looks at interaction corporate innovation with national innovations systems
Tallinn University of Technology	Technology Governance-Innovation Policy and Development	• covers economics, technology and innovation, and public administration in an interrelated way	• beyond the public dimension HSE MP includes corporate dimension and international impact
University of Bath	Innovation and Technology Management	• teaches engineering and science graduates key management and leadership skills whilst simultaneously training management graduates about the technological operations	• HSE MP is interdisciplinary including graudates from engineering, social and natural science
Pompeu Fabra University, Barcelona	Leadership and Management in Science and Innovation	• knowledge of the situation of scientific research and of the instruments necessary for its leadership and management	• MP includes research management as one element in the STI process
Utrecht University	Science and Innovation Management	• new ideas, knowledge or inventions are transformed into marketable innovations innovation research methods, theories and practices	• includes the broad STI scene, not only the operational level
The University of Edinburgh	Science & Technology Policy & Management	• Explicit focus on biotechnology and internet society	• No focus on selected industries, these are subject of case study work
KTH Royal Institute of Technology, Stockholm	Economics of Innovation and Growth	• Focus on innovation and entrepreneurship • prime factors behind value creation, economic prosperity and employment growth at enterprise, region and nation level	• entrepreneurship is seen as part of invention commercialization in different aspects – broader and more general view
ETH Zurich - Swiss Federal Institute of Technology	Management, Technology and Economics	• Aims at engineering, mathematics or natural sciences graduate to extend business and management knowledge	• Broader variety of graduates including social sciences • Includes policy dimension
Manchester	MSc Innovation	• Curriculum strongly focused on	• HSE MP offers a broader

University	Management and Entrepreneurship	company innovation management	STI policy management perspective
Maastricht University	Master Public Policy and Human Development - Specialisation Innovation, Institutions and Development	• Small portion of program is dedicated to STI (16 credits only) • STI management not included	• STI management for corporations and policy is core

All these programs have an explicit focus on a rather selected narrowly defined area. MIT Sloan Management, Tsinghua University and Singapore University place corporate technology and innovation management aspects at core of their programs while Stanford, Harvard and Eindhoven University of Technology and ENSCBP - Bordeaux show a tendency towards technological innovation as the main element in their programs. The Master program of the University of Bath focuses on technological innovation only and the Wageningen University on regional development, the University of Edinburgh on science, technology and innovation studies at policy level. The MCI Management Center Innsbruck Corporate has a clear focus on innovation and intellectual property only while the University of East London explores the complex, dynamic relations between social and technological forces shaping innovation processes in an international context. The Tallinn University of Technology covers economics, technology and innovation, and public administration in an interrelated way. The Utrecht University and Pompeu Fabra University, Barcelona stress teaching knowledge of the situation of scientific research and of the instruments necessary for its leadership and management and KTH Royal Institute of Technology, Stockholm looks at innovation and entrepreneurship. The University of Edinburgh focuses on biotechnology and internet society and the ETH Zurich - Swiss Federal Institute of Technology aims at engineering, mathematics or natural sciences graduates to extend business and management knowledge.

Currently there are no comparable programs in Russia. However, some programs with a clearly narrower scope are offered in Russian language as shown in the table.

Institution	Master Program title	Main focus	Comments
NRU HSE	Company Management of Research, Development and Innovations	• innovation entrepreneurship for engineering and natural science graduates	• Included in HSE MP and complemented by national dimension • possible cooperation
The Russian Presidential Academy of National Economy and Public Administration	Innovation management	• Corporate innovation focus	• HSE MP includes national innovation system and policy
	Technology management	• Innovation business and commercialization of technologies	• HSE MP includes social innovation and other types of innovation as well and policy dimension
State University of Management	Management of innovation business development	• focus on innovation and entrepreneurship	• HSE MP has a broader context of innovation management, also includes also policy level.
Moscow Institute of Physics and Technology	Science intensive technology and economics of innovation	• teaches engineering and science graduates key management and leadership skills whilst simultaneously training	• HSE MP has a broader context, includes also policy level. HSE MP is interdisciplinary including graduates from social sciences

		management graduates about the technological operations	and has international focus.

The NRU HSE MP goes clearly beyond these existing Master programs by bringing together the different STI aspects from the policy point of view and the corporate innovation management view. Existing programs are targeted at either view but not incorporating the overarching STI view like the NRU HSE MP does. The NRU HSE MP can be considered a generalist MP whereas almost all other STI related programs are targeted niche programs. Consequently graduates from the NRU HSE MP have a broader field of potential employers and positions to take then graduates from narrow niche programs. Furthermore the faculty of the NRU HSE MP gives students a very broad horizon since each course is taught by an experienced expert in the respective field. Other programs commonly employ faculty members from the same field which is a major limitation for a broad interdisciplinary view. In addition the NRU HSE MP targets at students with different backgrounds which reflects realities in daily work routines much more than the narrower target groups of other programs.

International cooperation of the MP

The MP has negotiated agreements with international universities on the mutual acceptance of courses which are part of the NRU HSE MP and which are also included in other universities Master Programs. This opens NRU HSE MP students the opportunity to select a number of courses from other universities worldwide and allows international students to spend a limited period of time at NRU HSE to attend courses and obtain credits accepted at their home institutions.

The MP has also established dual degree programs with European universities.

Major competencies

The curriculum is designed to equip students with knowledge and competences which are in demand at a global level. From the program students receive:

- knowledge of contemporary theories of STI, methodology of scientific research, theoretical and applied research competences, knowledge of history, conditions and tendencies for STI development, forecasting of STI development;
- organizational and managerial skills for STI in public authorities, private and public institutions and funding agencies, skills of selection and estimation of entrepreneurial ideas, personnel management, team-building, design and presentation of innovative projects;
- global perspectives and horizon on science, technology and innovation and the ability to make assessments in the field of STI policy and Management, taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development work;
- knowledge and understanding of the field of STI Policy and Management, including both broad knowledge in the field and substantially deeper knowledge of certain parts of the field, together with deeper insight into current research and development work, the ability to identify need of further knowledge and to take responsibility for developing knowledge;
- understanding of the role of STI in economic growth and how different social, economic and spatial contexts influence processes of innovation and entrepreneurship;
- possess cross disciplinary and interdisciplinary thinking and a strong understanding of the nature of science, technology and innovation and a good command of English language.

Potential employment opportunities

The combination of the STI policy sphere and corporate innovation management as specializations in one MP gives students the possibility to target their education towards future jobs. The employment opportunities include national and foreign employers. The STI policy agenda is now on the front burner in many developed and developing countries.

Employment potential for Russian students
The Russian employment market has grown significantly during the last several years due to public policy initiatives and certain improvements in the innovation sector performance (increase in industrial innovation expenditures and industrial innovation turnover, growth of R&D expenditures in business enterprise sector) leading to an extension of potential employers:

- federal and regional government agencies (e.g. the RF Ministry for Economic Development, the RF Ministry of Education and Science, the RF Ministry of Industry and Trade, the RF Ministry of Natural Resources and Environment and others) (most of them now include a department responsible for STI);
- development institutions (Russian Venture Company, Rusnano, Skolkovo, Bank for Development and Foreign Economic Affairs (Vnesheconombank), the Foundation for Assistance to Small Innovative Enterprises) and science foundations (the Russian Science Foundation, the Russian Foundation for Basic Research, Russian Foundation for Humanities and others), whose budget funding is gradually growing;
- large-scale innovative projects (i.e. construction of high-speed railways Moscow-Kazan involves 80 000 jobs during the construction phase and 30 000 – at the maintenance stage);
- industrial enterprises including 60 major state-owned companies (SOEs) implementing innovation strategies (overall, accounting for more than 4 million workers), such as Gazprom, Rosneft, Russian Railways, Rostechnologii, Rosatom (most of them have now innovation departments);
- major large-scale national research centres (Kurchatov Institute, TSAGI, etc.);
- 25 innovation clusters in different Russian regions with anticipated private investments of 1.6 trillion roubles in 2012-2016;
- public research centers and science cities (e.g. Zelenograd, Dubna, Obninsk, Fryazino, Koltsovo, Chernogolovka);
- R&D and innovation centers of multinational companies localized in Russia (including Knauf, Henkel, Volkswagen, Nestle, Bayer);
- international and domestic consulting companies (including KPMG, Deloitte, Ernst&Young, PricewaterhouseCoopers);
- international organizations (OECD, UNIDO, UNESCO, World Bank, WIPO, Development Banks);
- 29 National Research Universities and 15 universities – winners of the government grant to promote Russian universities in the world rankings;
- over 2000 spin-offs of universities and research institutions.

Employment potential for international students
International students enjoy similar employment opportunities as Russian students. There is an increasing demand for international labor by the different Russian employers currently. Moreover the international labor market offers additional potential such as:

- national ministries, STI support and funding agencies and development institutions in the respective home countries of students, especially in countries having bilateral STI cooperation agreements with Russia;

- national universities and research institutes as well as such entities with English as working language;
- industrial enterprises in student's home countries;
- multinational, international industrial enterprises with R&D and innovation centers in different countries such as IBM, Novartis, BASF, Mercedes-Benz, Bosch.

In summary students enjoy a truly multidisciplinary international MP offering a broad range of potential employment opportunities as shown in the table.

	Russian students	International students
STI Policy	• International organizations – *Policy Advisor/Analyst, Economist* • National public institutions (federal and regional ministries, federal STI funding agencies) – *Manager, Senior Manager* • Regional institutions –*Head of Unit, Manager, Senior Manager* • Academia – *Researcher, Senior Research, Assistant Professor*	• International organizations - *Policy Advisor/Analyst, Economist* • National public institutions (governments, STI funding agencies) – *Policy Analyst, Head of Unit, Economist, Researcher* • Academia - *Researcher, Senior Research, Assistant Professor*
STI management	• Russian companies – *manager corporate strategy, head corporate strategy, manager R&D, manager / head new business development, manager marketing* • Russian financial institutions – *market analyst, economist*, technology analyst • consulting companies – *consultant, senior consultant, manager* • international companies – *manager corporate strategy, manager international relations, manager R&D* • academia - *Researcher, Senior Research, Assistant Professor*	• companies - *manager corporate strategy, head corporate strategy, manager R&D, manager / head new business development, manager marketing* • financial institutions – *market analyst, technology analyst* • consulting companies – *consultant, senior consultant, manager* • international companies – *manager corporate strategy, manager international relations, manager R&D* • academia- *Researcher, Senior Research, Assistant Professor*

The program structure

The program is structured along 4 lines:

- Generalist Education (mandatory courses)
- Optional Education (elective courses)
- Research Seminars / workshops
- Knowledge application (internship)

Generalist Education courses are designed to teach the basic knowledge on STI. Special attention is given to the unique characteristics of project management for R&D and innovation projects under uncertainty. The six mandatory courses include:

- Scientific Research Methods for STI
- Economics of Innovation
- Strategies in STI Management
- STI Policy
- Measurement of STI
- Foresight and Strategic Planning

Building on the basic teaching of the STI phenomena from a broad perspective in the generalist education courses 2 specialization streams are offered to students allowing them to choose optional education in one of the following fields:

- STI management is targeted at company innovation management and
- STI policy which is aimed at the STI policy dimension.

Students wishing to focus on one area still have to attend the mandatory course from the other focus area. The optional education is mainly achieved in the elective courses offered for this purpose, e.g. of the total 10 elective thematic courses offered courses related to STI management and courses related to STI policy. Students have the choice to combine these courses accordingly.

The MP is structured to make the students familiar with the basics of STI in the first two modules of year one. All courses in this module are mandatory for students. Courses taught in the program are always split in lectures and seminars. Lectures give the students the knowledge necessary to solve STI related challenges while seminars are intended to problem solving with the use of scientific instruments and methods. During the whole program students will attend a research seminar which is aimed at practical exercises in scientific and practical sense of solving problems and developing solutions. In the second year of the program the research seminar will also require students to detect problems and challenges and formulate respective responses using scientific methods.

Students have to prepare a Master thesis by the end of the 2nd year. After the second module in year 2 students will choose a course which shall serve the umbrella theme for their Master theses. Course leaders will act as thesis supervisors. The master thesis should include a self-made research and is to demonstrate the skills received by the students. The curriculum of Master's program STI is designed in accordance with contemporary Russian and foreign standards for the specialists in the field of STI. The program consists of mandatory courses and elective courses on STI. Seminars are integral part of courses. A research seminar is obligatory for all students which educates and trains students in academic writing, problem recognition and solving and in presentation skills. The internship starts with third module and is held at the leading national and international organizations of public and private sectors.

All courses are taught on the basis of scientific literature, including reference books, case studies and empirical work provided by the faculty of the program. Apart from HSE faculty, experts from other Russian universities, international cooperation partners, public authorities, international organizations and companies are imbedded into the educational process.

A total of 10 elective courses are offered of which students have to choose 6 elective courses. Students are free to choose more than 6elective courses but only the 6of them chosen first will be included in the overall evaluation being part of the final grade. Other additional courses chosen by students will not be included in the final grade.

The concept of the Research Seminar

The Research Seminar is a major element of the curriculum of master's programs combining the traditional educational activities and students self-initiated and conducted work on selected STI

problems. Students learn to apply and further develop the knowledge obtained in courses, e.g. lectures and seminars, for discursive practices. They undertake independent research with substantial supervision by experienced researchers.

The Research Seminar aims to organize an intensive discussion of current ideas, issues and projects in the field of STI, as well as their own - both individual and collective - research projects of students. In addition the Research Seminar helps to develop students' skills in collaborative research and the promotion of research and publication activities. An important goal of the Research Seminar is to direct students to the application of global STI practices in the Russian context and the further development of Russian STI. Thus, the objectives of the Research Seminar are:

- An intensive introduction to the issues and methods of current STI
- The development of scientific working skills and public speaking skills of collective and individual work of research projects
- Support of students in the specification of their research interests and identification of research topics
- Supervision of students' work selected STI topics, among which are:
    - globalization of STI
    - intellectual property in the light of open innovation and globalization of science and innovation
    - the ‘think global - act local’ paradigm in STI
    - governance of innovation systems – the implementation of national STI strategies
    - innovation strategies in competitive markets
    - in-house innovation vs outsourcing innovation activities
    - innovations strategies for public research organizations

The topics of the Research Seminar will be more narrowly defined and be in line with current ongoing research at HSE ISSEK. The aim is to integrate students in professional research work and give students early stage guidance for publication and communication of their research work.

During the Research Seminar different methodologies will be applied:

- Guest lectures by renown experts – both practitioners and scientists
- Interactive discussions
- Students presentations and discussions
- Essay writing
- Group work for problem solving

The work prepared in the Research Seminar will be collected and stored in a database accessible to students. Establishment and maintenance of this electronic inventory will be in the responsibility of the students to give them an opportunity to learn ‘knowledge management’ applications.

Participation in the Research Seminar is mandatory for all students. In the last two modules the research seminar will be used as a platform for students to introduce and present their master thesis and discuss the work.

Research work undertaken in seminars and workshops enrich the teaching course work. The research seminar is mandatory for all students and puts special emphasis on introducing and training scientific work principles, scientific presentations and discussions. Approaches to the use of knowledge gathered during the program for practical application are in the focus of internship, where case studies and real projects are worked on to enhance the application of knowledge from the program.

During the Research Seminar students are trained in work on academic projects, academic writing, presentation skills and essay and thesis preparation in the first module. In the

subsequent modules students carry out independent research tasks and write an essay in each module. Essay writing is complemented by presentations of the essay and discussion among the students. The Research seminar will also be used as a forum for students to introduce their internship programs and the experiences collected there with relevance to STI and potential for further academic work.

Internship

The Internship is an integral element of the program during which the students learn to apply knowledge gathered in lectures and seminars. The internship lasts at least 540 academic hours equaling 15 credits. At the beginning of the internship students define one or more projects with direct relevance to the courses included in the Master Program. The student and the organization hosting the student as intern develop an internship program which needs to be approved by the program director. After the internship the students prepares a report about the major achievements during the internship and the competences acquired. This report is the basis for giving credits to the students. The internship itself is run by the hosting organization and the student, the program director might undertake occasional visits to the hosting organization. In addition to applying knowledge learned the students are expected to detect problems and challenges the hosting organization experiences with relevance to the field of study and introduce these in seminars during the program.
There are four principle opportunities for students to find internship places:

1) They might be occupied with an ongoing position in an organization. In this case a dedicated internship program with the employer needs to be developed and approved.
2) Proposed internship places by HSE. HSE ISSEK will propose potential internship places and agree on the internship program with the host organization. It could be federal ministries (for example, RF Ministry of Education and Science, RF Ministry of Natural resources and ecology), large companies (for example, Gazprom, Rosneft, Aeroflot) and other organizations.
3) Internship within the Institute for Statistical Studies and Economics of Knowledge. Students will be employed as research assistants at HSE ISSEK.
4) Own initiative. Students propose internships on their own initiative.

The goals of the internship are

- the practical use of the theoretical knowledge,
- the practical experience of the environment in which such projects are practiced in daily operations,
- the identification of research needs in the internship host organization which is considered a stimulus for students' scientific work in course of the Master thesis but also for HSE research activities.

Students are expected to work on dedicated projects with direct relevance to the chosen field of specialization. The projects have to be described prior the internship including the objectives, the aim and approach of the project. After the internship a report is prepared which shows how the project work was done and which results were achieved.

Characterization of human resources

The complexity and uniqueness of the program requires special competences from the supervising people, e.g. the faculty, course directors and program director as well as management.

The faculty members are all experienced scholars and practitioners in their field. Their competences are in line with the 2 specializations streams incorporated in the MP. Most of faculty possess significant teaching and scientific experience of more than 7 years, some reach 30-40 years of teaching experience at leading universities in Western European Countries, the US and Canada. All faculty members have significant track records in scientific publications and consulting work for corporations, federal and regional governments and agencies as well as for international organizations such as OECD, UNESCO, UNIDO, WIPO, EPO, World Bank among others. Among the faculty members are also practitioners who previously worked in leading consulting companies, national STI policy bodies like the Swiss Science and Technology Council and private companies like Ford Motor Corporation.

In addition to academics faculty is recruited from international organizations like the OECD which are leading in the STI field. This guarantees lectures and seminars about the most recent trends and developments globally and at national level. STI practitioners from Russian companies and international companies will be invited for dedicated guest lectures in each course and the Research Seminar.