صندوق دعم البحث العلمي

المملكة الأردنية الهاشمية

المجلس الأعلى للعلوم والتكنولوجيا

Defining Scientific Research Priorities in Jordan for the Years 2011-2020

Higher Council for Science & Technology

General Secretariat

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Preface

Under a generous patronage of HRH Prince Al – Hassan bin Talal, President of the Higher Council for Science and Technology, the project of determining the scientific research priorities in the Hashemite kingdom of Jordan, for the coming ten years was launched on 18/8/2009, with the support of the scientific research support fund, as a practical translation of the aspiration of the HCST to map out a clear map for the Jordanian researcher, and raise its glance to scientific research and its future priorities, by using the Delfi scientific, international methodology with the participation of hundreds of clear – sighted experts and specialists in scrutinizing the national needs of scientific research and development in the different sectors, which have been determined in 14 sectors, including for the first time: human, educational, social and Islamic sciences, as well as national security, culture, arts and information, which has given this contribution to the national, comprehensive feature, and reinforced the credibility of its outcomes, in addition to granting it a significant national value which deserves support at both the local and international levels.

One who is acquainted with the status of the scientific research in the Hashemite Kingdom of Jordan and the outcomes of the project of determining the priorities of scientific research, sees clearly the tremendous stock of significant research issues in various extremely important sectors, which can be addressed by researchers, in order to contribute to solving numerous problems suffered by different sectors in the national economy, thus contributing to push forward the wheel of economic, social and cultural development in the Kingdom.

Starting there from, we hope that universities and concerned scientific research centers direct the attention of researchers to benefit from this national effort, in order to push forward the progress of scientific research, in consistency with the visions of His Majesty King Abdullah II and the ambitions of HRH Prince Al – Hassan bin Talal, in achieving the desired positive change, which starts form determining the national priorities and addressing the problems facing the developmental progress in our beloved country through directed and sober scientific research.

Higher Council of Science and Technology

Secretary General

Steering Committee Speech

The project of determining the scientific research priorities in the Hashemite Kingdom of Jordan for the years (2011- 2020), is a scientific national demonstration, that substantiates the visions of His Majesty King Abdullah II bin Al- Hussein regarding the importance of scientific research in achieving comprehensive, sustainable development, as well as the ambitions of HRH Prince Al- Hassan bin Talal to reach an efficient policy and a national strategy for science, technology and innovation, with the aim of strengthening the effective coordination between the Higher Council of Science and Technology and the Scientific Research Support Fund, in order to direct the expenditures on scientific research towards fields necessary for social and economic developmental plans and imposed by age challenges and national, regional and international drivers of change.

In order to achieve the goals of the project objectively, the Delphi methodology was applied, since it has proven to be globally successful in mapping out policies and determining priorities by experts and specialists. HCST has aspired to implement the project within the determined time frame.

Therefore, it has formed a steering committee, a technical committee and 14 sectorial committees covering all scientific fields, with the contribution of researchers and experts from different universities and research institutions, as well as representatives from public and private sectors and the civil society.

The steering committee has prepared the executive plan of the project, which has determined the time phases and the tasks of the committees.

It is worth mentioning that the Delphi methodology required seeking assistance through the opinions of hundreds of experts and researchers other than the members of the sectorial committees in order to determine the main issues and research problems in each sector. This has required large logistic efforts, especially to determine the addresses of the contributors, as well as to send, receive and analyze the questionnaires in a suitable manner. In order to reduce mixing of main topics and prevent the repetition of research problems in more than one sector, the steering committee has held several meetings in the presence of the heads of the sectorial committees, and the members of the technical committee. It should be emphasized that it was not possible to agree unanimously on the implementation of the Delphi methodology, especially after discovering a difference in the viewpoints of the members of the sectorial committees on the one hand and the experts from outside the committees on the other, regarding the determination of the research problems of national priority.

Therefore, it was necessary to rely on the experiences of the members of sectorial committees to determine the research problems with utmost significance and the ones with lower priority.

This project comes in synchronization with other national projects and initiatives, the most important of which is setting the national policy and strategy for science, technology and innovation for the years (2012- 2016), as well as the campaign of the

cavaliers of change in coping with the drivers of change, led by HRH Princess Sumaya bint Al- Hassan. It is hoped that all these projects and initiatives help in framing and directing the expenditures to scientific research priorities that serve the government's executive developmental programs, emanating from the national agenda and "we are all Jordan" programs and supporting the competitiveness of the Jordanian economy by using advanced technology and relying on creativity, development and innovation.

Head of Steering Committee

Introduction

In order to substantiate the exalted royal visions in reinforcing the role of scientific research in the process of social and economic development in the Hashemite Kingdom of Jordan, and in the light of the recommendations of the "national agenda" and " we are all Jordan " related to scientific research, as well as to realize the content of the national policy and strategy for science and technology, and their executive plan for the years (2006 – 2010), which is prepared by the HCST, and in accordance to the national strategy of the scientific research support fund at the Ministry of Higher Education and Scientific Research in its fourth axis: " tightening and coordinating the cooperation with the HCST in the field of its work " , as well as to reinforce the existing cooperation between the Council and the Fund in the field of scientific research. The project " Determining the Scientific Research Priorities in the Hashemite Kingdom of Jordan for the Coming Ten Years (2011 – 2020) ", came to map out the way in front of the national institutions and researchers at Jordanian universities and research and development centers as a contribution in realizing the comprehensive, sustainable national development in order to cope with scientific and technological development.

For the sake of activating the role of scientific research in the economic and social development, it was necessary to determine the national priorities focused upon by national policies and strategies concerned with scientific, technological and innovative activities, including scientific research activities and initiatives in which the concerned institutions are highly interested. Therefore, this important national project came with the aim of setting the fundamentals of sound and efficient planning for the progress of scientific research and development in Jordan.

The project deals with all scientific sectors. 14 sectorial committees have been formed, covering all scientific fields and areas. Each of those committees includes a group of experts, researchers and specialists, who represent different national institutions, such as: public and private universities, scientific centers, private sector institutions, civil society institutions, in addition to the members of the steering committee and the members of the technical committee of the project, with a total of (139) researchers and specialists. The aforementioned committees have also called for the assistance of (570) experts who filled the questionnaires for the four rounds.

The detailed goals of the project are as follows:

1. Determining the subjects of scientific research priorities in different fields of science, technology and innovation for the coming ten years.

2. Determining the research issues with utmost priority and those with lower priority within the main subjects.

3. Directing researchers towards the scientific research tracks through determining the research issues with utmost priority within the main subjects.

Determining the scientific research priorities in advance supports the ability of decision making, especially when these priorities are based on the vision and insight of highly qualified experts who were sought for assistance. Therefore, these priorities are distinguished by a very high credibility, which motivates researchers at research

institutions and centers to adopt them, through preparing research project proposals to attract support and financing of the concerned parties at both the national and international levels. In this case, the determination of research priorities realizes, in addition to the direct goals, indirect goals, which are increasing the internal efficiency of legislations accredited at scientific and research institutions and centers, related to scientific research, as well as directing support and investment in scientific research based on the in advance determined priorities.

Therefore, the priorities take part in resolving national problems, which in turn contributes in pushing forward the wheel of development in different fields.

Here, the economic feasibility is achieved to the highest degree when investing in scientific research or supporting it, especially when the quality of scientific research is coupled with the national requirements in the different sectors and is in consistency with those requirements.

The national priority research issues pave the way in front of scientific research institutions and their researchers for teamwork to elevate research, development and innovation among these institutions and researchers, as well as between them and the internationally distinguished scientific research institutions, reinforcing the empowering environments required for scientific research and knowledge, adding to this that nurturing research and development groups among different institutions is considered a strong indication to the range of cooperation between scientific and research institutions and production sectors, which could be realized through this project.

The determination of research priorities in the scientific, social, human, educational, cultural, information and security sectors gives scientific research the feature of comprehensiveness and realizes balance among the different sectors, which is positively reflected on the concept of comprehensive development.

The HCST also looks forward to make out of this significant national project a first step on the way of shaping an integrated national vision of the role of scientific research in elevating the comprehensive economic development.

The Council wishes that this vision becomes shared among all who are concerned as members and institutions of the scientific and technological society, as well as beneficiaries in economic and social sectors and decision makers, with the aim of giving the research and development priorities determined in this project a strong push.

It is hoped that the outcomes of this project have determined the accurate frame of the national policy in the field of directing national efforts and initiatives towards supporting, financing and nurturing research and development projects as well as budgeting the resources needed to implement them, with the aim of realizing the economic and social development in our valued country.

The determination of scientific research and development priorities in the Hashemite Kingdom of Jordan is an ongoing and integrated process.

The periodic assessment of this process remains a certain insurance of its credibility and success.

Work Methodology

The Delphi methodology was implemented in this project, since it is one of the most suitable ways to be agreed upon unanimously in a national issue.

This methodology is one of the most famous methods of investigation and prediction in future studies. It also helps the decision maker map out the policies and determine the alternatives, in addition to that it is a methodology to reinforce consistency and achieve harmony among experts in the field of a decision or an issue related to future. The Delphi methodology includes a series of consecutive questionnaires in the context of processing the information possessed by experts in a specific field.

The Delphi methodology allows the realization of unanimousity in resolving the significant problems without direct interaction between experts, in order to avoid the effect of outstanding members on the decisions of the group. This method contributes in emphasizing the independent thinking of experts and the well studied opinion formation, as well as removing any pressure on the proposed ideas, which plays a role in reducing self factors affecting the judgement related to an issue based on apparent persuasion.

This methodology relies on the determination and discussion of choices through the following steps:

1. Subject determination.
2. Determination of participating members among experts and people of opinion and future vision.
3. Designing a question list which contains questions about the solution choices, and sending the list individually to the experts asking for their opinions .
4. Analyzing, briefing and grouping of answers in similar groups, then writing the summary down in a short report.
5. Sending the short report again to the experts and requesting them to record their responses regarding their expectations about the problems and the solutions.
6. Repeating steps 4 and 5.
7. Collecting the final opinions and putting them in the form of a final report including the solution of the problem in detail.

It is noted that the Delphi methodology needs a relatively long waiting time to obtain the replies of the experts and write the reports. This methodology suits the complicated problems, the solution of which requires accurate strategic planning .

Changes and modifications have been carried out on the Delphi methodology in order to make it more suitable to realize the goals of this project. The fifth step, in which it is requested to record the responses of the experts regarding their expectations, was neglected. The project has undergone 4 consequtive rounds containing 4 questionnaires, so that the output of each questionnaire is considered the input of the next one. The questionnaires have been filled up by a number of specialists and

experts, selected by the sectorial committees, in addition to the members of the sectorial committees whenever necessary.

- Preparation to start the project

The preparation to start the project has been carried out through the following steps :

• Forming the project`s steering committee, see appendix (e).

• Forming the project`s technical committee, see appendix (e).

• Determining clearly the goals of the project.

• Determining the most important sectors, in which the scientific research priorities are to be determined, by the steering committee .

• Forming the sectorial committees and appointing their heads, by the steering committee, taking into account the diversity in experiences and specializations in each sector, see appendix (e).

• Presenting an explanation by the technical committee to the heads and members of the sectorial committees about the project and its goals, as well as its way of implementation.

• Preparing an executive plan for the project, by the steering committee and the technical one, see appendix (f).

First round

The First round included the following:

• The specialized sectorial committees started to determine the main and important axes in each sector, through brainstorming.

The main axes in each sector have been agreed upon.

• The specialized sectorial committee has nominated at least (7) experts to contribute in determining the main subjects of priority in each axis .

• Questionnaire (1) has been designed by the sectorial committee in the form of open questions to obtain the required information, as follows:

- What are the most important subjects, in your opinion, which are connected to the axis and, as you think, are of a priority that makes them deserve to be a main subject of research in the coming ten years؟

- Questionnaire (1) contains the main axes, which have been previously determined, in order to obtain information about the main subjects of priority in each axis.

- The members of the sectorial committee have distributed questionnaire (1) to the chosen experts to determine the main subjects of priority in each axis, upon which the research will be concentrated during the coming ten years .

- The questionnaires have been collected after being filled up.

- The sectorial committee has discussed the subjects proposed in the questionnaires and restricted them in the form of specific subjects, after restructuring the subjects and grouping the similar ones within each axis.

Second round

The second round included the following:

- The sectorial committee has designed questionnaire (2), containing the short list of research subjects proposed by the respondents in the first round.

- The sectorial committee requested some of its members and some of the respondents in the first round to give each research subject a degree according to a likert scale consisting of 5 degrees (1=minimum priority ,…, 5= maximum priority).

- The technical committee calculated the descriptive statistics for the degrees of each subject, including: the median, the mode and the semi-interquartile range.

- The committee chose at most (10) main research subjects which obtained the highest median values and the lowest semi-interquartile range values, so that all main axes were covered .

Third round

The third round included the following:

- The sectorial committee prepared questionnaire (3), containing the list of main subjects, resulting from the second round.

- The sectorial committee determined at least five experts for each subject, according to their specializations, work fields and research interests.

- The committee distributed questionnaire (3) to the experts through e-mail or personal contact or by both methods. The experts were asked to determine the bysubjects or the important research issues with maximum priority for each main subject specified to each of them.

- The sectorial committee discussed the replies of the experts, then it checked and formulated them. The similar ones were merged, so that the final research issues under each subject were enclosed.

Fourth round

- The sectorial committee designed questionnaire (4), containing the accurate research issues resulting from the third round .

- The sectorial committee requested the respondents to questionnaire (3), to give each bysubject a degree according to a likert scale consisting of 5 degrees : (1= minimum priority, … , 5= maximum priority).

- The technical committee calculated the descriptive statistics of the degrees of each subject as in the second round.

- The committee chose three bysubjects/ accurate research issues in each one of the selected main subjects. Then, it arranged them according to the importance of each subject individually, so that bysubjects with the highest median values and the lowest values of semi-interquartile rang are the research issues of maximum priority.

The role of the steering committee and the technical committee in executing the project.

- The outcomes of the four rounds for each sectorial committee were accredited by the steering committee in the presence of the technical committee and the heads of the sectorial committees.

- According to the decisions of the steering committee, the sectorial committees kept the research issues related to each subject and classified them into research issues with maximum priority (the first three research issues according to the outcomes of the fourth round) in most cases, and research issues with less priority (the remaining research issues).

- The lists of research issues were prepared in Arabic and English.

- Thirty research issues have been accredited as research issues with maximum priority for each one of the 14 sectors.

The steering committee of the project was eager to comply with the Delphi methodology. The technical committee introduced this way and explained it to the members of the different committees.

It also emphasized the compliance with this methodology, especially with connection to determining the axes, subjects, accurate research issues and priorities. But, at the implementation, the steering committee and the technical committee found that the outcomes of the second and third rounds did not highly comply with the Delphi methodology in relation to the clarity of subjects and the accuracy of research issues, for the following reasons:

Some responses which came from a number of experts were ambiguous. There was a confusion between the subject and the research issue.

- There was a confusion between the subject and the research issue by some of the members of the sectorial committees.

- Some of the committees did not comply with the indicators agreed upon in arranging the priorities.

Therefore, the steering committee has guided the technical committee to intensify the meetings with the sectorial committees in order to review the outcomes of the second round and correct the situation in accordance with the work methodology. Then, the steering committee has discussed the results of the meetings in the presence of the technical committee and the heads of the sectorial committees. It also endorsed (10) subjects for each sector and followed the same previous mechanism to discuss the outcomes of the third round (research issues related to each subject) presented by the experts.

The technical committee has reviewed these issues with the members of each sectorial committee. After presenting the outcomes of the reviewing process to the steering committee, as well as discussing and checking them with the technical committee and the heads of the sectorial committees, many research issues were reformulated in the different sectors.

Regarding the outcomes of the fourth round (accurate research issues with highest priority and those with less priority), the steering committee used a different mechanism which was manifested by the formation of bycommittees, each of which included one member of the steering committee, one member of the technical committee and the head of the concerned sectorial committee, with the task of accurate reviewing of the final reports presented by the sectorial committees.

Definitely, these committees have read the accurate research issues, reformulated them where necessary and omitted the repetitions among the different sectors.

The steering committee was eager to review the work of the sectorial committees and discuss it at the end of each round, going out from the fact that the member of the steering committee and the technical committee are experts in their fields, and from the eagerness to present the research issues clearly and accurately, so that these issues reflect national priorities.

Research Issues of Top Priority

Antiquities & Tourism

Subject	Research Issues of Top Priority
Documenting of Structures and Archaeological and Heritage Sites	• Documenting sites and both archaeological and vernacular buildings facing various threats.
	• Application of Geographical Information Systems in developing a data-base for archaeological and vernacular buildings.
Conservation and Restoration of Archaeological Sites and Monuments	• Exploring the status of the technical staff involved in conservation, preservation, presentation and monitoring of cultural heritage.
	• Role of applying preventative conservation in minimizing the danger of deterioration of cultural properties.
	• Characterization of chemicals and other materials used in various conservation and restoration processes.
Legislations of Antiquities, Heritage and Tourism.	• Optimization of the role of legislations in the prevailing-trafficking and abuse of cultural properties.
	• The role of legislations in rehabilitation of archaeological and traditional sites for touristic purposes.
Electronic Marketing in Jordanian Tourism	• Use of IT in documenting & marketing archeological and touristic sites.
	• Obstacles of the circulation and development of e-marketing of archeological and touristic sites.
Training of Personnel working in Archaeology and Heritage	• Methods for developing museum display.
	• Documenting of museum collections.
	• Preserving, storing and monitoring of museum collections.
Different Tourism Patterns	• Developing of different patterns of tourism.
	• Developing & determination of touristic trails.
Investment in Tourism and Hotels Sector	• Operating cost of tourism projects.
	• Evaluation status of human resources in the tourism and hotel sector.
	• Relative advantages of Jordan as an attractive destination for tourism.
Internal Tourism	• Developing internal tourism products.
	• Role of women in tourism sector.
Tour Guidance in Jordan	• Reviewing the most important personell, attitudinal and knowledge traits for the tour guide.
	• Evaluation of the tour guides performance from tourist's point of view.
Tourism Associations and Their Iimpact on Development of Tourism in Jordan	• Codes of ethics and their role in the functioning of organizations of tourism.
Analysis of Information about Antiquities	• Analysis of the excavated archaeological objects.
	• Excavated and surveyed pottery sherds and vessels.
	• Ancient rituals, beliefs and religions as reflected by the uncovered archaeological materials.
Tourism Education and Public Awarness	• Enhancing local community in understanding the importance of the archaeological legacy, heritage and tourism.
	• The role of the various local mass-media in public awareness and education.
	• Effect of awareness of the importance of antiquities and heritage amongst school students.

National Security

Subject	Research Issues of Top Priority
Missiles Manufacturing	• Manufacturing surface-surface missiles with a range of 150-300 km.
	• Development and manufacturing of anti-tank missiles/rockets.
Manufacturing of Missiles' Sub-systems	• Study of manufacturing and producing missile/rocket motors.
	• Study of producing missile guidance systems.
	• Design, development and production of different types of missiles fuel.
Enhancement of the Will to Fight	• The importance of training and arming in enhancing the will to fight.
	• Impact of a national education, religious and moral guidance in enhancing the will to fight.
	• Development and preparation of the "theater of operations" in enhancing the will to fight.
Stability of Domestic Front	• The impact of corruption and cronyism on national security.
	• The impact of economic and social development imbalances on national security.
	• Role of the kingdom in providing political support and assistance to both Palestinians and Iraqis and its importance.
Technology of Defense Industry	• Development of an effective and secured national command, control, communications and computer system.
	• The development of national encryption software.
	• Importance of research application in nanotechnology for the development of defense technology.
National Capabilities and Terrorism	• Importance of the role of rehabilitation and training programs to enhance the capability of anti-terrorism security agencies.
	• The impact of monitoring technology in counter-terrorism operations.
	• Importance of dealing with extremism and atonement ideology.
Evaluation of Risks and Disasters on the National Level	• Assessing the effects of seismic risk on the cities and densely populated areas.
	• The importance of establishing a national data bank for risks and disasters to deal with their consequences effectively.
	• Assess the risks resulting from dealing with hazardous materials and dangerous wastes.
National Security Agencies and Investment	• Developing the security services capabilities in investment operations nationally and regionally.
	• Promote and develop the role of the armed forces and security agencies in national development.
	• Develop and improve performance of the Military Consumer Corporation.
Rehabilitation Centers National Security	• The role of state institutions and civil society organizations in follow-up care for inmates.
	• The importance of developing a national strategy for reform and rehabilitation of inmates.

	• Enhancement of the role of social and physiological scholars in managing and rehabilitating inmates.

Information & Communication Technology

Subject	Research Issues of Top Priority
Information Security & Computer Crimes	• Building & management of e-information Emergency Response Team (CERT):
	• Security of data transfer over national networks.
	• Development of security algorithms for electronic smart cards & tokens.
Efficiency and Design of Computer Networks	• Security of wired and wireless computer networks.
	• Infrastructure, protocols and applications of the new generation computer's networks.
	• Computer's networks management and the national computer networks.
Software Engineering	• Building of criteria and foundations for software development.
	• Programming languages evaluation criteria's
	• Software quality assurance.
Creating and Repairing of the Iinfra -Structure for the Internet Applications	• Internet application development by using the safe and available software.
	• Multimedia transfer (audio and image) over internet protocol.
	• Development of the geographical information system infrastructure.
Arabic language computing and processing	• Arabic searching engines.
	• Arabic text databases content searching.
	• Arabic language corpus.
Information Technology in Health, Energy, Environment and Agriculture	• Software tools for solar system best utilization.
	• Using ICT in health care.
	• Software tools for pollution rates automatic detecting.
Electronic Content and Education and Knowledge-Based Society	• Design & implementation in an electronic & interactive SW learning.
	• Determining of new criteria for the e-content and building Arabic learning standards.
Developing the Arabic Electronic Content	• Arabic e-content management and standards.
	• Specialized Arabic content development.
	• Developing specialized social networks websites.
Technology Awareness and its Acceptance Inspiration	• Enrichment of ICT penetration in Jordan.
	• Supporting computer utilization and its interactive applications at the higher education sector.
	• Technology utilization for people with special needs.
Management of Information Systems and Knowledge Management	• Application development of the superior management supportive systems at the Jordanian work environment.
	• Application development of the E-university.
	• Application development for the E-government.

Culture, Arts and Media

Subject	Research Issues of Top Priority
Data Banks and Centers of Culture, Arts and Media	• The influence of use and administration of Information system in the fields of culture.
	• The influence of digital technology on artistic issues.
The Role of Culture, Arts and Media in Maintaining the History, Heritage and Arabic Identity of Jordan	• Assessing the role of the official and private Jordanian cultural institutions in enhancing the national identity.
	• Assessing the role of the documentary films in documenting the Jordan identity.
Surveys of Public Opinion of **Citizens' Priorities on Cultural, Artistic and Media**	• Assessing the role, the means and the impact of media in disseminating national awareness.
Manipulating, Artistic, Cultural and Media Products in Enhancing Civic and National Unity in the Society	• Strength and weakness elements in media discourse of the Jordanian State and their role in the development.
	• Culture and arts as sources of physical and spiritual strength in the Jordanian society.
	• The role of the private sector in developing culture, arts and media.
The Role of Culture, Arts and Media in Promoting Humanity **and Avoiding Fundamentalism and**	• The influence of Jordan's mass media in dealing with the social violence.
	• The role of cultural and media institutions in protecting creativity.
Enhancing Behavioral, Spiritual and Moral Immunities among Youth and Society	• The role of local communities and educational institutions in enhancing morals through culture, arts and mass media.
	• The role of culture, arts and media in enhancing the values of work and production.
	• The influence of internet and satellites on young Jordanians values.
	• The influence of Jordanian mass media on young Jordanian's values.
The Role of Culture, Arts and Media in Approximating Arab Societies and Different Civilization (Understanding the Other), and Expertise Exchanges Amongst Them	• The influence of Islamic artistic heritage on other civilizations.
	• The role of arts and media on dialogue with the other.
	• Bridging gaps with Jordanian expatriate minorities through arts, culture and media.
Culture, Arts and Media as an Optimal Means for Designing and Producing Media Programmes in Jordan's National Comprehensive Development and Education	• Manipulating modern technologies in attracting audience to artistic production.
	• Methods and means of disseminating aesthetic values and enhancing them in the Jordanian Society.
The Influence of Political, Economic, Social and Technological Challenges on the Jordanian Artistic, Cultural and Media Status under Globalization	• Measuring attitudes of the Jordanian audience towards arts.
	• Culture, arts and media encountering current and future challenges.

Culture, Arts, and Media: Morals, Professionality and Developing Creativity and Rennovation	• Cultural, artistic and media system: nature, conditions and development.
	• Analysing cultural and artistic standards in the social bringing up process.
	• Methods of developing extra-curricula activities in Jordanian universities and their influence on university development.

Subject	**Research Issues of Top Priority**
Culture, Arts and Information: Comparative Studies and Spreading Critical Thinking Culture	• Art critique in media and improving of literary taste.
	• Public freedoms and critical thinking.
The Role of Universities and Scientific Institutions in Developing Scientific Research in the Fields of Culture, Arts and Media	• Studying the positive impacts of spreading the culture of the scientific research and the needs of the Jordanian young people for the development of culture of production and critical thinking.
Culture, Arts and Media and the Future of Arabic Language	• The role of the institutions of culture, arts, and media in the maintenance of the accuracy of the Arabic language.
Translation(an Open Window) on the Culture of the Other	• The role of translation as a window on other universal cultures.
	• Developing translation programmes in the course plans of Jordanian universities.

Humanities, Social Sciences & Languages

Subject	Research Issues of Top Priority
Sociology	• Socio-economic and political consequences of poverty and unemployment.
	• Measurement of corruption and favoritism in Jordan.
	• Drug abuse in Jordan.
	• The impact of poverty and unemployment on marriage, single and divorce rate.
	• Causes of women harassment .
	• Car accidents in Jordan.
	• Risk factors in social violence.
	• The impact of social values on corruption immunization.
	• Evaluation of anti-corruption organizations.
Translation	• The problems of scientific translation in Jordan.
	• Standards of quality literary translation.
	• The relationship between language and identity.
	• Arabic, interaction with the other in an era of globalization.
History	• A study of Jordanian documents.
	• Jordan in western documents.
	• Jordan in foreign travelogues.
	• Jordanian eminent personalities in the twentieth and twenty-first centuries.
	• Tribal lore and tribal law in Jordan.
	• Social history of Jordan.
	• Jordan in Arab mass media.
Arabic Language	• Editing of Jordanian literary and historical texts.
	• Problems of computerization and programming in Jordan.
	• The Role of Jordanian institutions in the arabicization movement.
	• Problems of teaching Arabic syntax to non-native learners.
	• The role of Jordanian institutions in upholding Arabic and protecting national identity.
	• The hashemites and their role in protecting Jordanian national identity.
Geography	• Applications of remote sensing and geographic information systems in the areas of human environment and improvement of the style of living.
	• Applied research in national geography in economy and environment.
	• The impact of spatial relations on the geographical distribution of social systems, urban ization and population within the geographic territory.
English Language	• The translation of major literary Arab figures (dramatists, novelists, short story writers and critics).
	• The image of the other in western thought and literature.
	• Films (compatibility with original text)

Financial, Economic & Administrative Sciences

Subject	Research Issues of Top Priority
Monetary and Fiscal Policies	• Banks' merger and its impact on Jordanian banks.
	• The impact of liquidity flow on capital markets in Jordan.
	• The impact of financial stability and interest rates on the national economy.
Food Security and Jordan Foreign Trade	• The role of the Jordanian industrial and agricultural sectors in food security.
	• Competitive advantage for productive sectors in foreign trading.
	• Enhancing competitiveness of productive sectors in foreign trading.
Business Ethics and Social Responsibility	• Studies of levels of transparency and honesty in offering public service in accordance with international standards.
	• The extent of social responsibility practices in public and private sectors establishments.
	• Assessment and development of work ethics in public and private sectors.
International Financial and Economic Crisis	• The role of the Islamic economy in finding solutions for the financial crisis.
	• The impact of the international economic crisis on the financial and operational performance of Jordanian banks and the Jordanian economy.
	• Predictive studies of the financial crisis impact on the future work of the Jordanian banking sector.
	• The effectiveness and efficiency of auditing committees in public shareholding companies boards in Jordan.
	• The influence of the application of new international accounting standards on the performance of Jordanian companies.
	• The extent of the effectiveness of legislative control in capital markets.
Foreign Investment in Jordan	• The effect of converting the Kingdom to one bid free zone on attracting direct foreign investments.
	• Studies of foreign investment indicators and their re-assessment .
	• The impact of foreign investments on the performance of companies listed in Amman Stock Exchange.
Economic Cycle Indicators	• The extent of the effectiveness of government programs in catering for budget deficit.
	• The effectiveness of entrepreneur projects in combating the unemployment problem.
	• Foreign debts and their impact on economic development.
The Influence of Gulf States on Jordanian Economy	• Employment displacement in the Gulf States and its impact on Jordanian labor market.
	• The effect of a potential one Gulf currency on Jordanian trade balance.
	• Oil price change and its impact on prices and economic cost.
Privatization and Governance	• Assessment of regulation and privatization Jordanian economic policies.
	• The extent of the effectiveness of economic correction programs.
	• Organizational governance in public and private sectors.
Human Resources	• Reviewing the effectiveness of the principles and standards of appointments for top and middle level employees in the public and private sectors.
	• Assessment of efficiency and effectiveness of employment and training organizations in the public and private sectors.
	• The impact of restructuring compensation and incentives system on the performance of public and private sector organizations.

Basic Sciences

Subject	Research Issues of Top Priority
Materials	• Development of important polymers and their technical applications
	• Magnetic properties of new materials and composites
	• Preparation of thin films for various applications
	• Preparation of composite materials
	• Production of light, low-cost construction materials
Nano Technology	• Production of nanomaterials from different sources and its characterization.
	• Rehabilitation of sandy deserts and increasing productivity of agricultural produce.
	• Applications in biological systems. • Increasing efficiency of fuel cells, renewable energies and electronic devices.
	• Production of nanomaterials from different sources and its characterization.
Environment and Health	• Determination of levels of organic and inorganic pollutants in the cities
	• Transport of pollutants in the air
	• Identifying unconventional sources of pollution • Pesticide residues in vegetables
	• Determination of levels of organic and inorganic pollutants in the cities
Biology Science	• Development and cultivation of plants in desert areas, drought-tolerant and heat using modern techniques.
	• Isolation and study of microorganisms capable of dispose environmental waste, pesticides, oil, plastic and radioactive materials.
	• Extract genes from microorganisms in the environment of the Dead Sea and their transfer to agricultural crops to be genetically modified in order to be able to withstand and grow in saline areas.
Bio Technology	• Production of single monoclonal antibodies to identify the types of cancers and to detect pathogens.
	• Production of vaccines for infectious diseases, and preparation of them locally and study the immune response to these vaccines.
	• Production of anti-pathogenic bacteria and viruses, and other anti-cancer vehicles.
Energy	• Development of water heating systems, the efficiency of manufacture and applications of thermal systems.
	• Desalination of water in remote areas by using solar energy
	• Use of oil shale rock in cement industry in Jordan
	• Manipulation and utilization of by – products of mining and exploitation of oil shale deposits and uranium bearing minerals.
	• Environmental impacts of mining and exploitation of oil shale and uranium deposits.
	• Protection of surface water and groundwater of pollution resulting from mining and exploitation of oil shale and uranium deposits.
	• Pro-active measures to protect groundwater aquifer from pollution and depletion.
Mathematics and Statistics	• Designing experiments in health science and analyzing the statistical data with physicians.
	• Using mathematical modeling in Medical, Physical and Engineering applications.
	• Using mathematical modeling in the groundwater engineering and modeling its flow and pollution.

Islamic Sciences

Subject	Research Issues of Top Priority
Solidarity and unity among Muslims	• Frameworks for cooperation and joint action among Muslim countries.
	• Ideological fanaticism: causes and remedies
	• Extremism and its impact on the fragmentation of the nation
Childhood and Youth and their problems	• Problems of the youth (violence, drugs, unemployment …etc) and the role of faith based education in solving them.
	• Methodology for dealing with satellite TV and the Internet.
	• The culture of violence: its sources and means of prevention from Sharia perspective.
Contemporary Transactions	• Islamic Insurance: its disciplines and its rulings
	• Developments of Islamic banking
	• Stock Financial crises: causes, effects and ways of addressing them in Islamic Sharia
Investment and Financial Markets	• Risks and obstructions of investment from an Islamic perspective.
	• Stock Financial markets and their controls in Islamic Sharia.
	• Reliance on self resources and its effect on development in the light of Sharia.
Food Security	• Means of achieving food security in the light of Sharia.
Ethics of Dialogue	• Methodology of dialogue with the other and its controls in the Quran and the Sunnah.
	• Dialogue among the followers of religions: its basics, approaches, and purposes
The Foundations of Ijtihad (independent legal reasoning) and fatwa (advisory opinion)	• Collective Ijtihad (independent legal reasoning) and its institutions (importance, controls, and impacts)
	• Qualification for fatwa (advisory opinion) and the role of Sharia colleges.
Methodology of dealing with the Quran	• The role of Quranic context in interpretation (exegesis).
	• Methodology of research in the thematic interpretation (the word, the ayah (verse), and the surah).
Modern Trends and Contemporary Efforts in Serving the Quran	• The development of research in the miracles of the Quran
	• Towards a modern approach in Quranic exegesis.
	• Modernity and exegesis.
National Security	• The menace of extremism and fanaticism on national security.
	• The role of religious education in national security.
Methodology of Dealing with the Sunnah	• The methodological controls in dealing with the Sunnah and the biography of the prophet.
	• The role of intellect (reason) in comprehending the text in the Sunnah and the biography of the prophet.
Modernity and Contemporary Reading's Criticism of The Sunnah	• A comparison between the Mohaddithеen's criticism and the modernist's criticism of narrations.
	• The scientific interpretation of the Sunnah.
Contemporary Islamic discourse	• The Islamic discourse and the education of the youth.
	• Contemporary Islamic discourse; a study and criticism.

Educational & Teaching Sciences

Subject	Research Issues of Top Priority
Pre-School Teachers' Preparation Programs	• Current early child education plans and field training programs implemented in teachers preparation programs at Jordanian Universities and their compatibility to recent training strategies.
	• Preparation of child education teachers in light of international standards.
	• Assessment of teachers' preparation programs for child education in Jordanian universities.
Children's Teaching and Learning Strategies	• Common teaching and learning strategies used by kindergarten female teachers.
	• The degree to which kindergarten teachers possess teaching skills required for this stage.
	• Teaching strategies that maximize the level of achieving the educational goals in kindergarten stage.
Curricula of Basic Stage Education	• Curricula gaps in Science, Maths and Language as revealed by Jordanian students' performance and their learning mistakes in international tests (TIMSS & PISA).
	• The degree to which the first three grades curricula observe the Jordanian children's developmental standards.
	• The degree to which the basic stage curricula represent the national standards.
Preparation Programs for Basic Stage Teachers	• Teachers' education programs at Jordanian universities: progress and obstacles.
	• Training needs for basic stage teachers of non-educational majors based on the requirements of knowledge economy.
	• The degree to which teachers' education programs at Jordanian universities represent the professional teaching competencies.
Preparation Programs for Secondary Stage Teachers	• Training needs for secondary and vocational education teachers.
	• The economic and social statuses for secondary stage teachers and their reflections on their professional behavior.
Outcomes of Secondary and Vocational Education Outcomes and the Labor Market Needs	• The level of vocational education programs graduates mastery of the professional skills.
	• Evaluation of the internal and external efficiency of secondary vocational education stream at the Ministry of Education in light of the Educational Reform for Knowledge Economy Project (ERfKE).
	• Evaluation of vocational education programs in light of the labor market needs.
Accreditation and Quality Assurance in Higher Education Institutions	• Strengths and weaknesses in the academic programs offered by the Jordanian universities in light of international standards.
	• Developing the academic programs in Jordanian universities in light of the national standards for accreditation and quality assurance.
	• The degree to which the current national accreditation mechanisms contribute in achieving high quality outputs from the international quality models' perception.
Building the Academic and Administrative Capacities at the Higher Education Institutions	• Training needs for the faculty members in the Jordanian universities in light of knowledge economy requirements.
	• Developing quality programs based on 'Soft Skills' to develop performance of higher education institutions' employees.

Subject	Research Issues of Top Priority
	• Evaluation of the role of faculty members development centers at the Jordanian universities in building the academic and administrative capacities.
Higher Education Outputs and the Labor Market Needs	• Developing "Hard and Soft Skills" of higher education institutions graduates to be compatible with labor market needs.
	• Academic characteristics(qualifications) of students, unemployed and employed graduates from universities in Jordan: considerations for relevance.
	• The degree to which the outputs of higher education in Jordan are compatible with labor market needs.
Continuing Learning and Local Communities Development	• Building continual learning programs coping with the rapid information development in the world.
	• The ability of continual learning programs to meet the developmental needs for local communities.
	• The role of continual learning programs in building the administrative abilities at the Jordanian universities.

Agricultural and Veterinary Sciences

Subject	Research Issues of Top Priority
Sustainable Management of Natural Resources.	• Productivity improvement of soils and water.
	• Water and land use policies with regard to environmental, social and economical consideration.
	• Technologies of soil moisture monitoring.
Improvement of sustainable productivity of irrigated agriculture.	• Use of Unconventional water.
	• Epidemiology and etiology of economical plant pests.
	• Technologies to control extreme weather conditions (freezing, heat spills…etc) on farm production.
Improvement of sustainable productivity of animal production.	• Production and manufacturing of animal feed and feed alternatives.
	• Improvement and evaluation of animal's ability to withstand diseases and environmental factors.
	• Genetic improvement of animals
	• Animal diseases: survey and information systems..
	• Animal diseases diagnosis, protection and control
Improvement of productivity of sustainable rain fed agriculture.	• Improvement and introduction of horticultural and range plants with high yielding capacities under drought.
	• Grazing behavior and grazing capacity.
	• Effect of crop rotation on plant productivity.
Improvement of sustainable productivity of rangeland and forests.	• Water harvesting and water shed management.
	• Rehabilitation approaches of forests and rangeland areas.
	• Propagation and production of forest and range plants
Technology Innovation in Agriculture.	• Integrated pest management technologies and reduction of pesticide use.
	• Technologies of food additives production, food treatments, storage and packaging.
	• Animal biotic and reproductive technologies (artificial insemination, embryo transplants, genetic engineering and cloning…etc).
Marketing and competitiveness.	• Improvement of crop products that meets quality and safety standards and certificates.
	• The current agricultural product competitiveness for export to target markets
	• Analysis of agricultural produce export cost and price predictions.
Food and nutrition.	• Evaluation of Jordanians nutritional status with reference to mineral deficiency of some diseases.
	• Evaluation and improvement of food quality from biological and chemical aspects.
	• Improvement in food manufacturing.
Biodiversity.	• Management of bioecosystem.
	• Conservation of endangered genetic resources.
	• Identification and characterization of indigenous genetic resource in Jordan and their use.
Supporting Environment for Agriculture.	• Characteristics and limitations of agricultural production in small holdings.
	• Impact of legislative bylaws of natural resources on trade, farms

Subject	Research Issues of Top Priority
	and farming workers, prices and productivity of agricultural systems.
	• Technologies adaptation and transfer and enhancement of rural women role in agriculture.
	• Agricultural extension and economic and social characteristics of rural areas
	• Characteristics and limitations of agricultural production in small holdings.

Political & Legal Sciences

Subject	Research Issues of Top Priority
Procedural Justice and the Judiciary	• Developing the procedural laws to accelerate the disposition of cases and the application of the principle of specialization.
	• Developing the procedural laws of lawyer's work for the purposes of preventing judicial procrastination.
	• Alternative means to disputes resolution.
Developing Human Resources for the Judiciary	• Principle of judge specialization and its impact on the development of judiciary.
	• Continued training for judges and prosecutors and the mechanism of its development.
	• Importance of the role of the judicial assistant in the development of the judiciary.
King's Role in the Balance between Authorities in Jordan	• The King's role in the balance between authorities.
	• The role of the King constitutional power in developing the legislation authority.
	• The importance of establishing a supreme constitutional court
Allegations of Violence, Extremism and Terrorism in Islam	• Islam and the legitimate national resistance.
	• Globalization and religious extremism.
	• The Islamic position of terrorism.
Energy Legislations and Means of Investment in Energy	• Developing the regulatory and stimulating legislations for investment in alternative energy.
	• Developing mechanisms of dispute resolution in energy investment contracts.
	• The legal liability of energy waste.
Political Development / Political Parties	• The role of political opposition in Jordanian political system.
	• The impact of the legislations on the development of political parties in Jordan.
	• The impact of political parties programs on political development.
Islam and Politics	• Governance in Islam.
	• The political Islam and Islamic movements.
	• Political participation in Islam.
Governing Legislations in Monetary and Banking Policy	• Means of electronic payment and the legal protection for consumer.
	• Commercial practice and its importance in the development of banking transactions.
	• Legislations of monetary policy and Central Bank.
Jordan and International Relations	• Arab-Israeli conflict.
	• Jordan in international politics.
	• Jordanian-Israeli relations.
Jordanian Foreign Policy	• Jordan and regional policies.
	• Jordanian foreign policy and foreign aids.
	• Jordanian foreign policy and future challenges.

Medical & Pharmaceutical Sciences

Subject	Research Issues of Top Priority
Maternal Mortality, Morbidity and High Risk Pregnancy	• Factors associated with medical disorders of pregnancy.
	• Determination of fetal problems during pregnancy.
Primary Health Care and the Integration of Mental Health Services	• Assessment of primary health care in Jordan.
	• Epidemiology of mental health disorders and evaluation of mental health services in primary health care.
	• Promotion of psychosocial and physical health in the elderly.
Regenerative Medicine and Stem Cell Research	• The use of regenerative medicine in degenerative diseases.
	• Scaffold research in regenerative medicine.
Bebenign Hematology	• Factors associated with anemia.
	• Production of blood substitutes.
Heart Diseases	• Factors associated with ischemic heart diseases.
	• Epidemiology valvular heart diseases.
Diabetes Mellitus	• Prevention of diabetes mellitus.
Cancer	• Environmental and genetics factors associated with cancer.
	• Factors affecting spread of cancer in the body.
Behavioral and Social Determinates of Health	• Intervention and promotion of healthy lifestyle.
	• Psychosocial behaviors in relation to chronic illnesses.
Biomarkers Discovery for Diagnosis and Prognosis	• Biomarkers discovery and validation.
Molecular Epidemiology of Diseases	• Conducting population-specific genome wide studies to identify genetic variations and predisposition to diseases.
Respiratory Tract Infections	• Control of resistant tuberculosis.
Gastrointestinal Tract Infections (Diarrheal Diseases)	• Antibiotic abuse and bacterial resistance.
	• Causative agents of gastroenteritis.
Drug Design and Delivery Systems	• Development of new pro drugs.
	• Development of dosage forms for pediatric and geriatric patients.
Utilization of Jordanian Medicinal Plants	• Isolation and characterization of bioactive constituents of Jordanian medicinal plants.
	• Toxicity, safety and efficacy studies of Jordanian medicinal plants.
Dental Caries and Periodontal Diseases Prevention	• Evaluation of the effectiveness of school-based dental health programs.
	• Cost effectiveness of oral diseases treatment in Jordan.
	• Prevalence of periodontal diseases and risk factors among Jordanians.

Water & Environment Sciences

Subject	Research Issues of Top Priority
Integrated Approach to Water Resources Management	• Optimization of water resources at the basin level.
	• Developing the use of flood waters for artificial recharge and enhancing natural recharge.
	• Assessment of trans-boundary water resources: sharing, legislation and management.
Groundwater Recharge	• Assessment and vulnerability of recharge areas.
	• Suitability of reclaimed wastewater for groundwater recharge.
	• Modeling of groundwater recharge.
Innovations in Irrigation Water Management	• Optimizing the efficiency of the on-farm irrigation systems and management.
	• Management of water quality and its effect on irrigation water requirement.
	• Improving water use efficiency using deficit irrigation, resistant crops and biotechnology.
Water Safety and Public Health	• Water and wastewater related diseases: assessment, prevention and control.
	• Evaluation of new technologies in the treatment of waste water.
	• Water quality in the network and in storage tanks, wells and reservoirs; and intermittent water supply.
Integrated Waste Management	• Environmental risk assessment and management for existing landfills and dumpsites including impacts on groundwater pollution.
	• Application of integrated solid waste management at municipal pilot level.
	• Waste to energy (waste as a resource).
Databases and Information Systems for Water Resources and Environment	• Developing drinking water research information network and national environmental publication information system.
	• Upgrading the data bank for groundwater and surface water basins in Jordan.
	• Environmental information management systems for water supply and demand in Jordan.
Air Pollution and Control	• Health impacts of air pollution in hot spots in Jordan.
	• Development of dispersion models to identify exposure levels to pollutants and to establish air pollution indices.
	• Assessment of indoor air quality and confined places.
Traditional Knowledge and Empowerment of Local Communities in Water and Environment	• Water use ethics and values in the Jordanian society.
	• Investigation of the traditional knowledge related the exploitation of shallow aquifers.
Desertification Control and Drought Mitigation	• Drought prediction and impacts on natural resources and ecology.
	• Emergency / incident planning and vulnerability assessments for potential threats.
Impacts of Climate Change on Water and Environment	• Assessment of climate change impact on water resources in Jordan.
	• Mitigation and adaptation measures including preparedness framework to cope with climate change impact.
	• Statistical and dynamic downscaling of climate change scenarios.
Pollution Prevention, Minimization and Clean Production	• Implementation of cleaner production in the economic sectors.
	• Improving water efficiency in water intensive industrial and touristic facilities.

Engineering Sciences

Subject	Research Issues of Top Priority
Development and Utilization of Renewable Solar and Wind Energy Systems	• Development of solar energy technologies with respect to space heating, cooling and hot water for residential and industrial applications.
	• Development of electricity generation technologies that is related to wind energy conversion.
	• Development of equipment and systems for electricity generation from solar energy through concentrating solar power (CSP) and photovoltaic (PV) technologies.
Desalination	• Development and utilization of solar desalination technologies.
	• Development of innovative membranes for water desalination processes.
	• Utilization of nuclear energy in water desalination.
Mining of Oil Shale	• Development of optimal methods to exploit energy from oil shale.
	• Development of methods of extracting oil from oil shale.
	• Environmental impact assessment of oil shale mining methods.
Discovering and Mining of Uranium	• Specifying optimal methods for discovering and mining uranium ores.
	• Environmental impact assessment of uranium extraction.
	• Specifying suitable methods of extracting uranium.
Management of Energy and Environment	• Development of processes for energy utilization efficiency improvements with respect to sectors, systems, instruments and equipment.
	• Utilization of green factories for energy savings purposes.
	• Development of novel methods for bio fuel generation from industrial wastes.
Industrial Material and Products	• Development of new composite materials.
	• Development of high added value products from composite materials.
	• Developing new practically feasible materials from Jordanian raw materials (silica, phosphate and potash).
Construction Projects Management	• Development of contracting management of projects, execution requirements and organizing construction operation.
	• Assessment of the role of value engineering in quality upgrading and cost reduction of construction projects, execution and operation.
	• Management of crisis and cost variation of construction materials and insurance.
Communication Infrastructure	• Development of national networks architecture and fiber optics.
	• Development of information security and protection systems for networks.
	• Development of required infrastructure for multimedia.
Traffic Safety and Traffic Engineering	• Impacts of road user behaviors on accidents and traffic operation.
	• Effect of urban planning on accidents and traffic congestion.
	• Assessment of road safety (auditing).
Automation and Control	• Development of automation and control systems for industrial processes and equipment.
	• Development of protection systems.
	• Design and fabrication of sensors actuators, and drivers for special industrial applications.

Research Issues of Less Priority

Antiquities & Tourism

Subject	Research Issues of Less Priority
Documenting of Structures and Archaeological and Heritage Sites	• Use of modern scientific techniques for documenting archaeological and traditional sites, monuments and objects.
Conservation and Restoration of Archaeological Sites and Monuments	• The use of scientific and technical methods in conserving and retorting of archaeological and traditional buildings and objects.
Legislations of Antiquities, Heritage and Tourism	
Electronic Marketing in Jordanian Tourism	• Evaluating the web-sites of the Jordanian tourism companies.
	• Credit cards internet payments and their impact on encouraging tourism in Jordan.
Training of Personnel Working in Archaeology and Heritage	• Developing educational and cultural programs.
Different Tourism Pattern	
Investment in Tourism and Hotels Sector	• Reliable statistical data and its reflection on the investment in tourism sector.
	• Infra-structure and its impact on investment in tourism.
	• The impact of duplicity of authorities on licensing tourism projects and investments in the sector.
Internal Tourism	• Local transportation networks for tourist destinations.
	• The role of activities and cultural events in encouraging internal tourism.
Tour Guidance in Jordan	• Tour guide curricula and their importance in upgrading their efficiency.
	• Review of tour guides qualification and classifying them accordingly .
	• Role of women in tour guidance profession.
Tourism Associations and Their Impact on Development of Tourism in Jordan	• Evaluating tourism associations' performance to develop the profession and to support tourism.
	• Developing and improving the services of tourism associations.
Analysis of Information about Antiquities	• Ancient arts and architecture.
	• Deciphering the contents of the ancient inscriptions and writings by analyzing their scripts and languages.
Tourism Education and Public Awarness	

National Security

Subject	Research Issues of Less Priority
Missiles Manufacturing	• Study of the mechanics of projectiles relating to the manufacturing of missiles.
	• Development of night vision equipment using infra-red technology.
	• Development of mobile missile launchers.
Manufacturing of Missiles' Sub-systems	• Applied research needed for manufacture of explosives.
	• Development of electro-magnetic systems for jamming hostile electronic systems.
	• Study and development of anti-jamming equipment against hostile missiles.
Enhancement of the Will to Fight	• Importance and contribution of Jordan Armed Forces nationally and internationally.
	• Enhancement of Jordan Armed Forces' role in national development.
	• Providing protection against weapons of mass destruction
Stability of Domestic Front	• Promotion and enhancement of citizens' awareness and confidence regarding the importance of the role of security agencies.
	• Importance of eliminating and countering poverty and its causes.
	• Providing the appropriate environment and infrastructure required for encouraging investment in Jordan.
Technology of Defense Industry	• Development of communication systems.
	• Study and manufacture of equipment/material required for concealment, decoys and camouflage.
	• Development of a jamming system using laser and radio frequency technologies.
National Capabilities and Terrorism	• Importance of coordination among security agencies.
	• Analytical study of elements and causes of terrorism.
	• Enhancement of cooperation and coordination among security agencies at the national, regional and international levels.
Evaluation of Risks and Disasters at the National Level	• Study of how best to operationalize plans for mitigating the effects of natural disasters and hazards.
	• Study of the importance of developing an early warning system against possible disasters.
	• Evaluation of national capabilities and available resources in dealing with disasters.
National Security Agencies and Investment	• Study of the importance of establishing an independent/private bank for members of security agencies and the private sector.
	• Study and development of partnership between security agencies and private sector.
	• Evaluating and developing the national training scheme.
Rehabilitation Centers National Security	• Role of the private sector in employing inmates during their stay and after they depart the rehabilitation centers.
	• Role of civil society in rehabilitating inmates psychologically and vocationally.
	• Importance of media in changing stereotypes about inmates and rehabilitation centers.

Information & Communication Technology

Subject	Research Issues of Less Priority
Information Security & Computer Crimes	• Peer-to-Peer (P2P) infrastructure security protocols.
	• Implementation of telecommunication technologies for safe training & education.
	• Email filtering & anti-spam systems.
	• Security of internet applications oriented to portable devices.
	• Security over government electronic payment gateway.
Efficiency and Design of Computer Networks	• Design and analysis of computer networks performance.
	• Wireless sensor networks: applications, design and performance.
	• Applications of computer networks such as cloud computing & mobile applications.
	• Computer networks: quality services and multimedia tasks applications.
Software Engineering	• Software effectiveness & reliability measurements model development.
	• Automation of software inspection.
	• Software structural design.
	• Fault tolerant software.
	• Software maintenance.
	• Software ethical standard.
	• Applied software engineering.
	• Software engineering economics and cost estimation.
	• Developing new programmable concepts.
	• Cultural dimensions associated to social network development.
	• Mechanisms & techniques of outsourcing.
Creating and Repairing of the infrastructure for the Internet Applications	• Audio transfer over internet protocol.
	• Communication technology optimum deployment in education and training.
	• Traffic simulation over real transfer protocol at the application over internet.
	• Criteria for database standby copies.
Arabic Language Computing and Processing	• Automatic tools for Arabic language translation.
	• Identification of handwritten & printed Arabic language texts.
	• Arabic text grammatical treatment (analyzing the ends of words).
	• Arabic language semantic analysis.
	• Automatic Arabic translation processing (Arabic text analyzing to facilitate its translation into other languages).
Information Technology in Health, Energy, Environment and Agriculture	• Water resources control systems.
	• Biotechnology applications in health sector.
	• Agricultural resources control systems.
Electronic Content and Education and Knowledge-based Society	• Arabic e-content management and standards.
	• E-learning platforms.
	• Virtual reality techniques in e-learning.
Developing the Arabic Electronic Content	• Building the interfaces of the Arabic websites.
	• Developing of the electronic arabic dictionaries.
	• Arabic content industry infrastructure

Technology awareness and its acceptance inspiration	• Determining the elements that provide fun to the educational process using computers.

Subject	Research Issues of Less Priority
	• Modeling the technology's recognition & denial in the Jordanian society.
	• Developing the applications of the human & computer interaction in the Jordanian Society.
	• Directing of technology innovation in the Jordanian Society.
	• Promoting of computer utilization and its interactive applications according to the age ranges of users.
	• Information technology awareness and its role in technology recognition.
	• The consequences of applying the information systems & the strategic planning on the Jordanian community
	• The effect of computers on the learners and the learning process.
Management of Information Systems and Knowledge Management	• Expert system applications for management.
	• Developing applications for electronic banking.
	• Developing applications for human resource information systems in the Jordanian environment.
	• Developing information knowledge management in the Jordanian education & business environment.
	• Effective algorithms in knowledge management in the Jordanian enterprises.
	• Data mining and data warehousing in the knowledge management.

Culture, Arts and Media

Subject	Research Issues of Less Priority
Data Banks and Centers of Culture, Arts and Media	• Data base of arts and culture and its suitability to international experiences: a comparative study.
	• Intellectual property in Jordan: its laws and means of execution.
	• Establishments of civil society and their role in disseminating culture, arts and information.
	• The role of information design in building societal knowledge.
	• Survey for music literature in Jordan.
The Role of Culture, Arts and Media in Maintaining the History, Heritage and Arabic Identity of Jordan	• The relation between culture and identity.
	• Jordanian identity's values and symbols in the television's material directed to children.
	• The role of design shaping arts in introducing culture, identity and heritage.
	• Culture, heritage and the consumer's market.
	• The history of the audio visual arts in Jordan.
Surveys of Public Opinion of Citizens' Priorities on Cultural, Artistic and Media Topics	• Values and ethics of the artistic creativity.
	• Means of activating audiences artistic appreciation.
	• The reality of the Jordanian drama: assessing the current situation and future visions.
	• The picture and its role in introducing culture at levels of art, creativity and thought.
	• Digital culture and the youth generation.
	• A survey study for types of music preferred by the Jordanian listener.
Manipulating Artistic, Cultural and Media Products in Enhancing Civic and National Unity in the Society	• The influence of electronic media on the young generation from the citizens' point of view.
	• The significance of arts in beautifying and organizing the environment.
	• The relation between arts and economics.
	• The drama production in Jordan and its contribution in the national income.
	• Means of promoting the Jordanian artists and intellectuals.
	• Jordanian laws and legislations and their role in guaranteeing the cultural and artistic expression freedom.
	• The role of the family in enhancing the love of culture and arts since childhood.
The Role of Culture, Arts and Media in Promoting Humanity and Avoiding Fundamentalism and Terrorism	• The relation between accepting terrorism and the poor contribution in the cultural activities in Arab societies.
	• The treatment of Jordan's mass media to issues of terrorism.
	• The role of the national culture in confronting violence and terrorism.
	• The role of arts in developing the sense of beauty among school students in Jordan to resist violence and terrorism.
	• Children's drawings and features of violence they include.
	• The religious programmes in Jordanian and Arabic satellites and their role in distancing societies from fundamentalism.
	• The role of word in Jordanian songs in combating the social violence.

Enhancing Behavioral, Spiritual and Moral Immunities among Youth	• Meaning of moral and immoral and means of morality's attraction.
	• The relation between religion and morals and the significance of mental understanding of religion in protecting morals.

Subject	Research Issues of Less Priority
and Society	• Requirements of preparing educational advisors to perform an effective role towards morals in the society.
	• Information and society: the reflection of economic and social changes in Jordan on morals reflected by drama.
	• The role of worshipping in strengthening spiritual and moral values.
The Role of Culture, Arts and Media in Approximating Arab Societies and Different Civilizations (Understanding the Other) and Expertise Exchanges Amongst Them	• Directing the international cooperation for developing human relations among nations.
	• Unity of culture among elements of the Arab Nation and its influence and relation with the other.
	• Arab contemporary cultural dissemination in Europe and its influence on approximation among civilizations.
	• Contemporary means for approximation between Arab culture and other cultures.
	• Attitudes of Jordanian youth towards approximating between Arabs and other cultures.
	• The other in Jordanian plays and dramas and their role in enhancing communication.
	• Lawful and unlawful in Jordanian mass media and their impact on viewing the other.
Culture, Arts and Media as Optimal Means for Designing and Producing Media Programmes in Jordan's National Comprehensive Development and Education	• Classifying the Jordanian artistic products chronologically.
	• Documenting the names of the distinguished artists as well as their artistic products.
	• Manipulating the modern scientific methods in highlighting the aesthetic cultural product.
	• Analyzing the Jordanian cultural heritage to focus on its aesthetic features.
	• Mechanisms required for using art in expressing culture and information.
	• Determining the aesthetic arts needed by people.
	• A religious perspective on the negative stances related to fine arts.
	• The role of fine arts in organizing national media programmes and achieving their goals at the local level.
The Influnence of Political, Economic, Social and Technological Challenges on the Jordanian Artistic, Cultural and Media Status under Globalization	• Studies related to Jordanian creative people in the fields of culture, arts and information.
	• Nature and the role of picture in our age.
Culture, Arts and Media: Comparative Studies of Critical Thinking Culture	• Conceps and basics of public freedoms and means of enhancing critical thinking properties.
	• The role of design in encouraging freedom in work environment and its influence on developing the output of the design process as an innovative means for the attainment of critical thinking of people in charge.
	• The role of the Jordanian folkloric music in motivating critical thinking of Jordanian intellectual: an issue of challenging the critical thinking culture.

	• Music cultural colonization and its impact on public music taste in Jordan.
	• The practical role of the three sectors of the society (state, civil community and private sector) in enhancing freedoms.
	• The concept of freedom in Islam and its role in magnification of the

Subject	Research Issues of Less Priority
	culture of criticism in the individual's life in human societies.
	• Reconsidering the role of radio and television as two influential sources in promoting and spreading news reports and expressing freedoms and culture of criticism versus the electronic information and consorship challenging.
	• The role of private sector in maintaining public freedoms and enhancing the culture of critical thinking.
The Role of Universities and Scientific Institutions in Developing Scientific Research in the Fields of Culture, Arts and Media	• The role of higher education as a system with rules, procedures, inputs, processes and outputs as futuristic scientific planning emerges from monitoring the real situation, prescribing its problems and determining its priorities for the sake of appropriate solutions in the light of the available potentials and future vision.
	• Studying artistic criticism and mechanisms of its development among students of arts at universities and critics working in different fields and the extent of its reflection on creative thinking and critical sense.
	• The role of scientific research at academic institutions in confronting and satisfying the demands of local and regional markets and in understanding the society's requirements.
	• Disseminating the culture of scientific research in design which makes markets more vital and strategic goals.
	• Activating the academic organizations to serve comprehensive development.
Culture, Arts and Media and the Future of Arabic Language	• The language is the nation's identity and the reason of its existence; that is why it should be taken care of.
	• Culture and linguistic identity.
	• A study to determine the basics of the role of cultural, artistic and information institutions in maintaining the accuracy of the Arabic language.
	• Studying the role of the Jordanian citizen in maintaining the Arabic language accuracy.
	• Studying indicators which threaten the integrity of the Arabic language in the Jordanian society in particular and in the Arab world in general.
	• The language soundness leads to the soundness of creative critical thinking.
	• Arabic language calligraphy and its influential role in maintaining the Arabic language.
	• The problem of terminology in communication in the fields of culture, arts and information.
Translation as an Open Window on the Culture of the Other	• The new language in modern mass communications: conversation programmes as a model.
	• A statistical survey of books and studies on music available in Arabic language.
	• Publishing houses and their role in translating the universal literary and artistic works.

Humanities, Social Sciences & Languages

Subject	Research Issues of Less Priority
Sociology	• Causes of youth violence.
	• The effect of shame culture , poverty & unemployment in Jordan.
	• The effect of legislatives in drug abuse prevention.
	• The effect of general strains in youth and women problems.
	• The 0bstacles of corruption fighting
	• The obstacles of freedom & democracy in Jordan.
	• The relationship between imprudent behavior and car accidents.
	• The impact of socialization institution on national identity & national loyalty.
	• The effect of social justice on citizenship and national loyalty.
	• The effect of education in fighting poverty and unemployment
Translation	• Translating zionist writings and future plans for palestine and the Middle East.
	• Translation of the Arabic lexicon into English.
	• The impact of satellite telivision stations on standard Arabic.
	• Quality assurance criteria for scientific translation in Jordan.
	• A critical study of translations of the Holy Qur'an and orientalist studies of them
History	• Arab and foreign media reports on Jordan's Role in war and peace.
	• The Arab-Islamic cause in Jordanian media.
	• Development of the Jordanian mass media in the second half of the twentieth century.
	• Eminent personalities in Jordan from the time of the prophet to the end of the ottoman epoch.
	• Jordanian costumes: significance and implications.
Arabic language	• The Jordanian poetic and prose works during the princedom epoch: an annotated edition.
	• Problems and obstacles facing Arabicization in Jordan.
	• The future of Arabic lexicons in our digital age.
	• Problems of learning Arabic from the foreign learner's perspective.
	• The danger of colloquial language on the linguistic identity in Jordan.
	• Problems of teaching Arabic at western universities.
	• Jordanian universities' contribution to the task of editing the classical Arab heritage.

	• Computational description of the Arabic morphological and derivational systems.

Financial, Economic & Administrative Science

Subject	Research Issues of Less Priority
Monetary and Fiscal Policies	• Banking facilities and their impact on the Jordanian economy.
	• The future of the Jordanian valuation and its relationship to foreign currency baskets.
	• The impact of interest rate reduction and reviewing investments' financing policies on the national economy.
	• Assessment of monetary and fiscal policies for the Central Bank of Jordan.
	• Monetary surplus and its impact on the growth and development of the Jordanian capital market
	• The role of monetary and fiscal policies in supporting national economic projects.
	• The extent of conformance of Jordanian banks to capital sufficiency standards .
Food Security and Jordan Foreign Trade	• The role of qualified industrial zones in foreign tradin.
	• Export capabilities for Jordanian industries.
	• The real and financial impact of the adoption of a new currency replacing the Dollar on foreign trading.
	• The limitations of the Jordanian economy exposure in the regional and international arenas.
	• Inter-Arab trading and its impact on Jordanian trade balance.
	• Export opportunities for Jordanian products in international markets.
Business Ethics and Social Responsibility	• Problems of information and knowledge management in public and private establishments.
	• The application of total quality standards in the public and private sectors.
	• Analysis and evaluation of efficiency and effectiveness of general organizational performance.
International Financial and Economic Crisis	• The future of estate market following the financial crisis.
	• Assessment of current financial work following the financial crisis.
	• The international challenges facing Jordanian Banking work
	• Analysis and evaluation of financial control in public Jordanian organizations.
	• The impact of implementation of the principle of good governance on the performance of public shareholding companies.
	• The quality of internal quality control systems in public organizations and its role in predicting future performance.
Foreign Investment in Jordan	• The influence of the tax law on local and foreign investment.
	• The impact of direct foreign investments on economic output and ways of enhancement
Economic Cycle Indicators	• The role of international trade agreements in rectifying trade imbalance problems.

	• External debt and it's impact on economic development.
	• The future of unemployment in Jordan and the population growth.
	• The future of local currency in light of budget deficit and external debt.
	• Family businesses and their role in economic development.
The Influence of Gulf States on Jordanian	• Evaluating and output of bilateral and multilateral trade agreements with Gulf States.
Privatization and Governance	• The role of future public/private partnerships in economic growth.
	• The effect of merging financial support establishments.
Human Resources	• The extent of matching between human resources' capabilities and labor market requirements.

Basic Sciences

Subject	Research Issues of Less Priority
Materials	• Preparation of superconducting materials.
	• Preparation of devices of non-crystalline solids.
	• Production of new insulating materials using Jordanian materials.
	• Use of raw Jordanian fillers for the production of materials of high insulating properties.
	• Preparation of materials to absorb harmful gases and radioactive materials.
Nano technology	• Applications in added value industries.
Environment and Health	• Pollution of rainwater and the transport of pollutants from outside Jordan through it.
	• Determination of levels of pollutants in hot spots.
	• Chemistry of pesticides and their degradation products.
	• Determination of hormone levels in vegetables.
	• How to get rid of pesticides before consumption.
	• Determination of heavy metals in vegetables and fruits.
Biology Science	• Combating desertification in Jordan .
	• Development of patterns of living in desert areas.
	• Isolation and development of different bacterial species that live in Dead Sea environment and environments of hot springs.
	• The genes responsible for the production of enzymes for organisms capable to adapt and live in harsh environments and their use in industrial applications.
Bio Technology	• Development of vital genetic markers and proteins associated with diseases.
	• Development of methods to produce stem cells of different diseases and methods of application and use of this technology on humans.
	• Extraction of antibiotics from microorganisms.
	• Evaluation and production of drugs, in particular those related to the genetic content of the human person.
	• Cultivation and augmentation of micro-organisms producing antibiotics and drugs.
Energy	• Technical feasibility studies of the applications of solar energy systems.
	• Increasing efficiency of photovoltaic systems.
	• Development of photovoltaic manufacturing capability.
	• Development of energy saving equipment capability.

	• Development of highly efficient oil shale retorting and processing plans.
	• Environmental impact of power generation through direct oil shale combustion or retorting techniques.
	• Development of highly efficient solar energy concentrators.
	• Use of solar energy for brackish and sea water desalination.
Earth Science	• Geochemical and geophysical (radiation) exploration for radioactive minerals in the Pre-Cambrian and Paleozoic rocks in Wadi Araba and South Jordan.
	• Geophysical and geotechnical investigations of constraction sites of nuclear reactors and oil shale.
	• Treatment of solid, liquid, gaseous, radiation and leachates wastes of extraction techniques of oil shale and uranium deposits.

Subject	Research Issues of Less Priority
	• Development and improvement of water harvesting techniques and utilization of harvested waters in groundwater artificial recharge.
	• Exploitation of partially treated brackish water in deep aquifers in irrigation of selective agriculture .
	• Wastewater treatment using local raw materials.
Mathematics and Statistics	• Designing experiments about herbal treatment of diseases and analyzing the statistical data with chemists and pharmacists.
	• Modeling number of patients in major diseases to predict future numbers.
	• Comparing bioequivalence of locally produced major medicines to corresponding regional and international drugs.
	• Modeling the financial and economical indices and factors.
	• Developing numerical methods for solving differential equations and mathematical models.
	• Using mathematical modeling in financial and actuarial fields.
	• Designing mathematical and statistical packages to solve and analyze mathematical models.

Islamic Sciences

Subject	Research Issues of Less Priority
Solidarity and Unity Among Muslims	• Impact of globalization on the Muslim world.
Childhood and Youth and Their Problems	• The approach of Quran and Sunnah in instilling the values of virtue and the refinement of souls.
	• The stability of the muslim family and the challenges it faces.
Contemporary Transactions	• The relationship of Islamic banking with central banks.
Investment and Financial Markets	• Investment funds and their role in development.
Food Security	• Philanthropy and volunteerism and their impact on social solidarity.
Discourse Ethics	• Institutionalizing dialogue in the Quran and Sunnah.
The Foundations of Ijtihad (Independent Legal Reasoning) and Fatwa (Advisory Opinion)	• Advisory opinion (Fatwa) and means of modern communication.

Methodology of Dealing with the Quran	• Editing of terminology and its importance in controlling exegesis.
Modern Trends and Contemporary Efforts in Serving the Quran	• The scientific approach in exegesis.
National Security	• The role of good citizenship in achieving national security.
Methodology of Dealing with the Sunnah	• Documenting the sites of the Prophet biography in Jordan and its effects in promoting national belonging.
Modernity and Contemporary Reading Criticism of The Sunnah	• Schools of thought in contemporary reading of Sunnah.
Contemporary Islamic Discourse	• Modern techniques and the Islamic discourse.

Educational & Teaching Sciences

Subject	Research Issues of Less Priority
Pre-School Teachers' Preparation Programs	• Professional development criteria for promoting the competencies of child education teachers.
	• Selection criteria for enrollees in child education teachers' preparation programs.
Children's Teaching and Learning Strategies	• Kindergarten teaching and evaluation strategies in accordance with their ability to meet individual differences among learners.
	• Modern technology in children's learning and teaching: current status and aspirations.
Curricula of Basic Stage Education	• The cognitive structure of basic stage curricula in light of the educational objectives based on the national and international standards.
	• The degree to which the developed mathematics curricula of basic stage consider the NCTM standards.
	• The capability of basic stage curricula for development and keeping abreast with recent issues.
	• The effectiveness of basic stage curricula in helping children acquire life skills.
	• The degree to which the developed curricula consider recent universal concepts (democracy, human rights, environmental education, gender, population education, world heritage and bio - ethics).
Preparation Programs for Basic Stage Teachers	• Evaluation of classroom teachers' education programs at Jordanian universities.
	• The effectiveness of classroom teachers programs at Jordanian universities in developing the graduates' scientific research and thinking skills.
Preparation Programs for Secondary Stage Teachers	• The pedagogical content knowledge of secondary stage teachers in all subjects.
	• The beliefs of secondary stage teachers about learning and teaching and their relationship with their teaching practices.
	• The teaching philosophy perceived by enrollees in teachers' education programs in light of effective teaching requirements.
Outcomes of Secondary and Vocational Education and the Labor Market Needs	• An analysis of the labor market needs for vocational education graduates at the Ministry of Education in Jordan.
	• The satisfaction degree of employers towards vocational education outcomes.

	• The adopted criteria in the distribution of students over the secondary education streams and their capability in predicting the educational outcomes.
	• The level of secondary stage students mastery of "Soft Skills" needed to improve their capabilities to cope with work requirements.
	• Characteristics of employment and unemployment among graduates of vocational secondary education programs.
	• The changes in students' selections of academic majors (admission forms) in universities: are they social or professional preferences?
Accreditation and Quality Assurance in Higher Education Institutions	• Monitoring techniques of applying the accreditation standards: their development and indicators of effectiveness.
	• The degree of roles and responsibilities clarity for the cadre of higher education institutions in light of quality requirements.
Building the Academic and Administrative Capacities in	• Research abilities of faculty members at Jordanian universities: status and ways of development.

Subject	Research Issues of Less Priority
Higher Education	• Polices of building academic and administrative capacities at higher education institutions: an analytical study.
	• Future academic leaderships: characteristics and preparation.
Higher Education Outputs and the Labor Market Needs	• The flexibility of academic programs at the Jordanian universities and the labor market.
Continuous Learning and Local Community's Development	• Information and communication technology applications in continual self-learning: Jordanian case study.
	• The role of local communities in planning policies and development of continuous learning programs.
	• Continuous learning programs at the Jordanian universities: current status and ways of development.

Agricultural and Veterinary Sciences

Subject	Research Issues of Less Priority
Sustainable Management of Natural Resources	• Survey and evaluation of land and water resources.
	• Agricultural pattern and production and their relation to virtual water.
	• Land effect of fragmentation on agricutural production.
Improvement of Sustainable Productivity of Irrigated Agriculture	• Effect of water quality on crop water requirements.
	• Effect of rootstocks on productivity and disease resistance.
	• Agricultural pesticide residues.
Improvement of Sustainable Productivity of Animal Production	• Improvement of local breeds.
	• Prevention of animal infectious diseases.
	• Improvement of animal nutrition and feed quality.
Improvement of Productivity of Sustainable Rain- fed Agriculture	• Agricultural systems and agricultural machinery development to maximize productivity.
	• Improvement of nutritive value of agricultural byproducts.
Improvement of Sustainable Productivity of Rangeland and Forests	• Effect of rangeland protection on productivity.
	• Dangers threatening rangeland.
	• Forest evaluation as touristic and environmental resource.
Technology Innovation in	• Development of high producing varieties, breeds and races.

Agriculture	• Nontraditional packaging methods.
	• Biological control of pests.
Marketing and Competitiveness	• Effect of globalization on agricultural trade.
	• Effect of agricultural dual agreements on marketing.
Food and Nutrition	• Risk assessment of food borne pathogens.
	• Use of new ingredients in food production especially with traditional food.
	• Use of microorganisms in food production and preservation.
Biodiversity	• Socioeconomical programs for sustainability of ecological systems.
	• Collection and characterization of endangered local genetic resources.
	• Domestication of local wild genetic resources.
Supporting Environment for Agriculture	• Indicators of poverty and unemployment on agricultural production.
	• Development of agricultural research and extension legislations.
	• Maximization of rural women role in comprehending agricultural technologies.
	• Intellectual property in agriculture.

Political & Legal Sciences

Subject	Research Issues of Less Priority
Procedural Justice and the Judiciary	• Developing case management and its procedural rules.
	• Developing the evidence laws.
Developing Human Resources for the Judiciary	• Development of administrative staff/ assistant in the work of the judiciary.
King's Role in the Balance between Authorities in Jordan	• The letter of appointment role by his majesty the king in political reform in Jordan
	• The problem of provisional laws and the king's role in their issuance.
Allegations of Violence, Extremism and Terrorism in Islam	• Causes of violence in the Muslim world.
	• External factors and their impact on the spread of violence in the Islamic world.
Energy Legislations and Means of Investment in Energy	• The legal liability of the environmental pollution resulting from the use of energy sources.
	• The legal and judicial monitoring impact on the energy investment.
	• Developping energy investment legislations.
Political Development / Political Parties	• The historical development of political parties and its impact on political parties.
	• Religious (Islamic) political parties and their impact on the future of pluralism in Jordan.
	• The role of civil society organizations in developing the political parties in Jordan.
Islam and Politics	• Democracy and Shura: a comparative study.
	• The impact of electoral systems on political development.
Governing Legislations in Monetary and Banking Policy	• Methods of fostering legal monitoring on the banking sector.
	• Methods to foster monitoring on stock markets.
	• Developing legislations to ensure confidentiality.
Jordan and International Relations	• Jordan and the future Palestinian State.

Jordanian Foreign Policy	• Jordanian foreign policy and super powers.
	• Jordan -American relations.

Medical & Pharmaceutical Sciences

Subject	Research Issues of Less Priority
Maternal Mortality, Morbidity and High Risk Pregnancy	• Causes of maternal mortality and morbidity.
	• Reduction of cesarean section.
Primary Health Care and the Integration of Mental Health Services	• The level of knowledge, attitudes and behaviors of health personnel subject of mental illnesses.
	• Determination of mental illnesses and adolescents.
Regenerative Medicine and Stem Cell Research	• Stem cells role in producing a model for drug research and disease behavior.
Benign Hematology	• Genetic and applied aspects of inherited thrombotic, hemorrhagic and red cell diseases.
Heart Diseases	• Epidemiology of cardiomyopathies.
	• Epidemiology of arrhythmias.
	• Epidemiology of congenital heart diseases.
Diabetes Mellitus	• Treatment of juvenile onset diabetes mellitus.
	• Glycemic control and its determinants.
Cancer	
Behavioral and Social Determinates of Health	
Biomarkers Discovery for Diagnosis and Prognosis	• Biomarkers and developmental therapeutics in the most prevalent diseases.
	• Identify and qualify biomarkers and developmental therapeutics in genetic disorders.
	• Uses of bioinformatics.
	• Advancing the technologies of biomarker discovery, analysis and applicability.
Molecular Epidemiology of Diseases	• Risk factors of the most prevalent genetic diseases.
Respiratory Tract Infections	• Pneumonias and bronchitis.
	• Incidence of atypical pathogens.

	• Respiratory tract infections in hospital settings.
Gastrointestinal Tract Infections (Diarrheal Diseases)	• Causative agents of food poisoning, risk factors and prevention.
	• Microbial enterotoxins.
	• Molecular diagnosis of pathogens.
Drug Design and Delivery Systems	• Drug discovery via traditional structure activity relationship.
	• Chemical modification of already existing drugs to improve safety and efficacy and target anew route of administration.
Utilization of Jordanian Medicinal Plants	• Quality control, standardization and methods of analysis of biomarkers of herbal extracts.
	• Pharmaceutical development and clinical studies on Jordanian medicinal plants.
	• Evaluation of the biological effects of medicinal plants other than treatment of diseases.
Dental Caries and Periodontal Disease Prevention	• Evaluation of pit and fissure sealant in high risk caries school children.

Water & Environment Sciences

Subject	Research Issues of Less Priority
Integrated Approach to Water Resources Management	• Conjunctive use of ground and surface water.
	• The use of reclaimed water as an alternative for fresh water in irrigation.
	• Innovation in water allocation and green engineering in the direction of environmental protection.
	• Research in water governance.
	• Green water management and optimizing its role in economic, social and environmental development.
	• Harmony assessment between economic and financial dimensions and levels of national income in development of water resources and related energy.
Groundwater Recharge	• Effect of urbanization on groundwater recharge.
	• Watershed characterization to enhance runoff and optimization.
	• Enhancing groundwater natural recharge.
	• Groundwater shared aquifers (trans-boundary) management and legislations according to recharge potentials.
	• Evaluation of artificial recharge in new established reservoirs.
	• Site identification for groundwater recharge using GIS, RS and DSS.
	• Developing guidelines for groundwater recharge with reclaimed water.
Innovations in Irrigation Water Management	• Software for best use of water on farm (IMIS).
	• Tools and techniques for improving the precision of irrigation.
	• Real time monitoring of soil moisture for irrigation scheduling.
	• Optimization of the efficiency of the on-farm fertigation management for different crops and different agrozones.
	• Relation between harsh environmental conditions and deficit (conservative) irrigation.

	• Improving irrigation efficiency in protected agriculture under soil less.
	• Developing innovative filter techniques for sustainable irrigation with wastewater.
	• Open hydroponics: risks and opportunities.
	• New sustainable concepts and processes for optimization and upgrading of municipal wastewater and sludge treatment.
	• Dual water quality management (alternate irrigation at seasonal or crop level).
Water Safety and Public Health	• Occurrence of antibiotic-resistant bacteria in raw and reclaimed wastewater in Jordan.
	• Health risks and safety use of treated wastewater, excreta and grey water.
	• Diseases related to unsafe water, sanitation and/ or hygiene.
	• Health risks associated with bottled, mineral and treated drinking water, including water used in health care units.
	• Health risks associated with shortage of domestic water (water scarcity).
	• Low cost treatment of drinking water using environmental friendly materials and naturally occurring substances.
	• Environmental cost of water-related diseases and pollution.
	• Epidemiological studies on water and wastewater- related diseases.
	• Emerging and re-emerging waterborne pathogens.

Subject	Research Issues of Less Priority
Integrated Waste Management	• Environmental status of old and abandoned solid waste dump sites.
	• Methodological aspects of life cycle assessment for solid waste handling.
	• Development of suitable proactive regulations and guidelines for waste management.
	• Quantifying the amount of hazardous waste transported within Jordan and establishing a suitable tracking system.
	• Reduction, recycling and reuse of wastes (industrial, tourism facilities including hotels and restaurants, and construction waste).
	• Cost effective treatment methods for wastes streams including leachate from solid waste sites and medical wastes.
	• Financial and legal instruments suitable for Jordan to sustain an integrated solid wastes management approach.
	• Assessing potentials for CO_2 - reduction in wastes management.
	• Environmental valuation and validation of wastes management practices.
	• Less packaging (work along the supply chain as well as with consumer groups).
Databases and Information Systems for Water Resources and Environment	• Web-based GIS for environmental changes.
	• Application of remote sensing to link land cover with soil moisture.
	• Climatic indices databases for Jordan.
	• Integrated information database for environmental risk assessment.
	• Filling the gap of water and environmental information shortage through new technologies and approaches (GIS and remote sensing).
	• New approaches to digital soil mapping and prediction of soil attributes and other natural resources components.
	• Developing a national database for Jordan flora and fauna.

	• Developing a national map of contaminated sites and sources using GIS.
Air Pollution and Control	• Evaluation of air quality in key areas of Jordan and attributing the pollutants to their sources.
	• Air pollution due to radioactive substances.
	• Evaluating the effect of a motor vehicle as main sources of pollutants.
	• Bio-aerosol emission from wastewater treatment plants, sewage sludge, animal waste and others.
	• Control of air population through a comprehensive strategy based on population / urban and industrial expansion in Jordan (green cities).
	• Analysis of different air pollution control techniques to select the most effective ones.
Traditional Knowledge and Empowerment of Local Communities in Water and Environment	• Vitalization of Al- Hima system.
	• Study ancient and Nabatian practices in water storage and transport.
	• Behavioral comparative study in traditional and modern water consumption trends related to health.
	• The role of women as a traditional leadership in the Beduine society, in health and environmental protection.
	• Documentation and applications of the traditional knowledge related to natural resources.
	• Empowerment of the structural and cognitive social capital of the Beduine community.
Desertification Control and	• Characterization of the biological content of the arid and semiarid

Subject	Research Issues of Less Priority
Drought Mitigation	areas (seeds, fauna and flora).
	• The impacts of rangeland reserves on desertification.
	• Energy efficient and ecological solutions for Badia housing structures.
	• Impacts of macro water harvesting systems on biological diversity.
Impacts of Climate Change on Water and Environment	• Drought occurrence, monitoring thresholds, magnitude and preparedness and impacts on the agricultural production, and on economy in general, and other factors.
	• Optimization of cropping pattern under climate change condition in the Jordan Valley and the Highland.
	• Assessment and modeling of reservoir management as a mitigation tool to reduce climate change impacts.
	• Vegetation cover modeling and carbon sequestration study to evaluate vegetation potential to fix organic carbon in soil in relation to climate change impacts.
	• Quantifying greenhouse gases emissions as carbon trade "selling virtual carbon".
	• Remote sensing and GIS modeling for rainfall influences on agriculture, rangeland, forest and wetland.
Pollution Prevention, Minimization and Clean Production	• Integrated industrial wastewater recycling.
	• Industrial ecology; use the analogy of natural systems as an aid in understanding how to design sustainable industrial systems.
	• Life cycle assessment for products and services.
	• Environmental economics.
	• Environmental accounting.

Engineering Sciences

Subject	Research Issues of Less Priority
Development and Utilization of Renewable Solar and Wind Energy Systems	• Development of novel processes for renewable energy storage in different forms: thermal, electrical and hydraulic.
	• Development of processes to utilize solar energy in steam production for industrial applications.
	• Development of energy hybrid systems to utilize solar and wind energies for water pumping from artesian water wells.
Desalination	• Specifying the characteristics and minimization of scaling and fouling on membranes of desalination processes.
	• Development of optimal methods for brine disposal as wastewater of desalination process.
	• Optimal designs of solar desalination processes.
	• Design of independent (stand alone) water desalination units.
Mining of Oil Shale	• Development of methods and processes to utilize oil shale mining residuals.
	• Development of extraction processes of rare metals as by-products of oil shale mining.
Exploring and Mining of Uranium	• Classification of uranium types and isotopes in Jordanian ores.
	• Specifying and quantifying the risks associated with exploring and mining of uranium.
	• Estimation of water demand to extract uranium.
Management of Energy and Environment	• Development and applications of insulation materials and techniques.
	• Design and manufacturing of small wind energy turbines for industrial applications.
	• Development and application of the cogeneration/ hybrid energy systems.
	• Techniques to preserve energy security and sustainability for industrial purposes.
	• Development of techniques for industrial wastewater management and recycling.
	• Development of techniques for industrial solid waste management and recycling.
	• Development of tools and techniques for measurement of greenhouse gases emission levels.
Industrial Materials and Products	• Development of nano-technology based new products.
	• Development of recyclable, reusable and reproducible environment friendly products.
	• Development of intelligent products, instruments and equipment for different national applications.
	• Development of quality based national products.
Construction Projects Management	• Impact of technology variations on construction operations.
	• Effect of time factor on specifying the optimal cost of the construction operations.
	• Study of institutional organizations for construction & infrastructure projects.
Communication Infrastructure	• Analysis and modeling of signal trafficking and propagation.
	• Design and development of intelligent networks.
	• Design and development of innovative wireless transmission and smart antennas.

Subject	Research Issues of Less Priority
Traffic Safety and Traffic Engineering	• Utilization of intelligent systems to reduce accidents and congestions.
	• Effects of road geometric design on traffic accidents.
	• Development of traffic systems and traffic safety management.
Automation and Control	• Design of robotics, unmanned vehicles, and intelligent systems for special applications.
	• Utilization of computer for the design and fabrication of different applications.
	• Utilization of automation and control at micro/nano scale.
	• Development and utilization of embedded systems and systems integration.