CHAPTER FIVE

ANALYSIS OF THE DEFICIENCIES
OF THE FINANCIAL AND
BUDGETARY SYSTEM
OF
YARMOUK UNIVERSITY AND THE
STRATEGY
FOR
THEIR SOLUTIONS
Analysis of the Deficiencies of the Financial and Budgetary System of Yarmouk University and the Strategy for their Solutions:

Times are fast changing for public universities not only in Jordan, but in many parts of the world. Yarmouk University as a public university, is not an exception to it. On the contrary, it is fast becoming a model of the university plunged into chronic financial crisis, despite its fame as a very good university. Since 1993, it is having budget deficits which are in the rising crescendo and in 1997, it constituted 20 per cent or 1/5th of its total revenue and 17 percent of its total expenditure. When budget deficit becomes chronic and assumes the shape of financial crisis, it shows total failure of management of finances of the university. What went wrong or what is wrong with the management of finances of yarmouk university? Is there something wrong with the policy makers and top managers of the university? The answer is in the firm negative, as they are highly capable, sincere and efficient persons. But the fault essentially lies in the structure and system of financial management of the university. The system of financial management of yarmouk university is full of many inherent defects which make management less careful in expenditures, negligent in resource gathering and ill-informed about the true state of affairs pertaining to the finances of the university. So when the storm comes, they are taken unawares. But the scientific means and techniques are there available to warn us before the storm comes and gathers strength so that we can take proper steps in time to protect ourselves and ward off the crisis. Unless we take advantage of the modern techniques of financial management and the newly evolved scientific systems and abandon the traditional system of financial management and budget system and also give up certain other deficient financial techniques, yarmouk university will not be able to come out of the financial malaise in which it has plunged itself.
So, here we would like to enumerate these built-in defects of the financial management system of Yarmouk University which have almost become evident from our analysis of the finances of Yarmouk University in the 4th chapter and evolve an alternative system of financial management to be adopted by Yarmouk University. Let us first lay bare the defects and shortcomings of the system of financial management of Yarmouk University so that a planned alternative framework can emerge.

**Defects and Deficiencies of Financial Management System of Yarmouk University**

1. Use of cash-basis of accounting in place of a more scientific accrual basis.
2. Adoption of the line-item budget system.
3. Absence of scientific information system and consequent information GAP. Due to these basic defects, policy makers have been led to some wrong decisions, despite their good intentions, as for example,
4. Pricing of food and other items in the university restaurants at less than their actual cost and keeping rents for the students hostel and the tuition fees in the model school at lower levels.
5. Much over-expansion of the non-academic staff which is eating away the vitals of the finances of the university.

Let us now discuss these shortcomings one by one:

**1) Cash-basis of Accounting:**

Cash-basis of accounting works on the receipts and payments principle resulting into following distortions:

(a) When cash is received and when payments in cash are actually made, these accounts are recorded in the account books in the time period when they are actually received and the time period when they are actually paid, and not in the time period when money was earned or it
was due or the time when the goods, equipments or services were purchased. So revenues and expenditures are recorded in the account books in the wrong periods of time.

(b) Cash-Basis does not distinguish between recurrent expenditure and capital expenditure and so it becomes possible for recurrent expenditure to be excessive and thereby force capital expenditure to be minimal which means poor laboratories, less equipment, poor library, less infra structural facilities which may adversely affect the quality of education.

(c) It does not become possible to prepare the balance sheet and the income statement and hence it becomes very difficult for the management of the university and for the government and for other donors to gauge the correct condition of the finances of the university and thus take timely steps.

(d) It does not allow the higher management of the university to have proper planning, programming and budgeting, because they all require replacement of cash basis by accrual basis. Cash basis does not allow to assess costs properly and thus to have standard costing or any other method of proper costing which is required in planning and programming and budgeting. Without detailed costing, planning and programming and controlling and evaluation are not possible and the cash-basis does not allow these very things to happen. So we may say that on the cash-basis, scientific management or economic handling of resources is not possible.

Accrual Basis Of Accounting.

So, we strongly suggest the replacement of the cash-basis by the accrual basis in the accounting system of Yarmouk University. Time periods of earning income and the receipt of cash for it may be different and in the same way, time periods of purchasing the goods or
services and their payment may be different. The accrual basis registers income in records when earned and expenditure when things purchased while in cash basis, they are recorded in accounts in the time periods when cash for income earned is actually received and when cash payment for a purchased commodity is actually made and not when purchased.

In the accrual basis, recording of all revenues is done in the period, earned, all expenditures in the period when incurred, all assets in the period when bought and all liabilities in the period when incurred. So this basis removes all the defects of the cash basis and enables the financial management to understand the financial health of the university properly through the preparation of the income statement and the balance sheet. It also enables them to categorize recurrent expenditure as distinguished from capital expenditure and to understand the correct position regarding revenues and expenditures in their true time-periods. Thus the accounts prepared on the accrual basis are bereft of the distortions created in the accounts by the cash-basis. Now let us discuss the pros and cons of the line-item budget system.

(2) The Line-Item Budget System:

The line-item budget was the earliest budget system that was used in the not-for-profit organization. It had taken the place of the lump-sum budget system in the beginning of the 20th century. Thus it can be realized that it has been a very old system of budgeting and much water has run down in the yarmouk river since then and many more scientific and more efficient systems of budgeting have been evolved since then and it is now time to take advantage from them. But in yarmouk university, the same line-item budget-system is continued.
In the line-item budget system, past is taken as a guide, however much defective it may be. Whatever levels of expenditure and income were there last year, some amounts in each line-item are added and the new budget is prepared on this basis. It means that the defects of the past are not corrected as it can be done in the zero-budgeting system and the defective past is taken as a guide and the basis on which a new structure is erected however shaky and brittle the past basis may be. The formulators of the budget take the amount $Y$ from the budget of the previous year and add the marginal amount $b$ by (a certain fraction of $Y$) to previous $y$ so that they get the amount $y+b$ for the new budget. This is incrementalism which smacks of idleness on the part of budget makers and lack of vision.

The following are some of the main defects of the line-item budget system:

(a) Line-item budgeting is a sort of incrementalism and so they have got limited alternatives which can hardly differ from the prevailing policy measures whatever their nature may be.

(b) In this system, policy-making is found to be purely tactical and much short-ranged without any broad-based analysis of costs and benefits. Thus the present budget looks to be a mere replica of the past and the future budget will merely mirror the present.

(c) In such a system, rectification of past errors is not possible and hence most of the items of the budget are generally okayed and they require hardly any justification.

(d) If a programme was financed in the past once, it continues indefinitely with marginal increments or subtractions.

(e) Data based on line-item budgeting is defective, as it does not look into the defects of the past and so it cannot be utilized for planning and programming and for evaluation of results. So the policy makers cannot
be provided with meaningful financial data which can help them in formulation of better policies to rectify mistakes and remove deficiencies.

(f) The line-item budget may be described as the compromise formula budget system that encourages wrong decision making. Thus mistakes go on accumulating and a day comes when it explodes in the form of a severe financial crisis as it has happened with Yarmouk University in the present.

(g) Thus we see that this system leaves the management in the lurch when its help is most needed. It seems that it is inherently incapable of solving any serious policy problems or any related drawbacks.

Zero-Base Budgeting

Some financial management experts recommend zero base budgeting system for adoption. It is on the other extreme of the line-item budget system, as, in zero-base budgeting, it is required from every sub-manager or head of the department or the dean of the faculty to give reasons for his whole budget from scratch. Past is no guide and one cannot take expenditure on some item in the past as the basis and then add a certain fraction of it say, by to $y$ and get $y+by$ to be expenditure in the present budget for that particular item. You have to justify $y$ also and thus give reasons in justification for entire $y$ and by. This requires the help of cost-benefit analysis or cost-effective analysis or other types of analysis or to select from among competitive claims for allocation of resources—financial and other ones. So in this system, one has to show justification for funds for every activity in full detail. However in educational institutions, zero-base budgeting may not find a congenial atmosphere and may not evoke a harmonious chord. So we would like to recommend PPBS rather than zero-base budgeting for universities.
Now let us discuss the problem of the absence of the proper financial management information system.

(3) **Scientific Information System**

There is a difference between data and information. Data are mere raw facts and figures which are required to be organized if they are to help management to take decisions. Accounting entries, files and reports are data, but they do not become information unless and until they are compiled and interpreted systematically for the use of management.

We know that management is concerned with efficient use of resources which requires planning, programming, budgeting, implementing, accounting and controlling on the part of management and evaluating the use of scarce resources according to stipulated guidelines. Effectiveness of university management will be judged by its ability to enhance the capacity and also the flexibility of the university to respond to changing demand pressures and cost conditions and the efficiency of the system lies in the communication of meaningful information in the form which helps management to take proper decisions. We have yet to evolve such an information system in Yarmouk University.

Another point that we wish to emphasize is that this information can be stored for its use by management in future if such an information system exists.

The third point that we would like to stress is to make it a real system in the sense that its constituent parts (which may be deemed as sub-systems) should be brought together to function in unison so as to work as an integrated whole.

Then alone its capacity to provide meaningful information will increase and will assume a stable character.
In these difficult days which require cost-consciousness, the enumeration of the following advantages of the integrated and scientific information system will be an eye-opener for its adoption:

(i) Raw data will be transformed into meaningful information by being properly analyzed and systematized which will help management to take right decisions.

(ii) It being the function of the information system to transform data into meaningful information on a continuing basis, it can reach management in time when required.

(iii) It makes easy to produce data and to have data-analysis for any purpose that the management or the researcher likes, including the cost-benefit analysis.

(iv) It facilitates standardization which enhances consistency in information.

(v) It makes computerization of data meaningful and justified.

Now let us discuss the 4th defect of uneconomical subsidization which is a result of policy decision of management rather than that of the financial system.

(4) Uneconomical Policy Of Subsidization

There are three bodies where the university applies the policy of subsidization which implies the loss of revenues of about 335332 J.D. in amount for the university annually. This policy perhaps may be tolerable in the past before 1993, when the university was not facing rough weather in finances, but when it is passing through financial crisis at present, it cannot afford to continue this uneconomical policy of subsidization.
The three bodies where the policy of subsidization is applied are.

(I) University restaurants,
(II) Model school,
(III) University hostel,

Let us deal with their finances briefly and try to show how the revenue from these three sources could be increased and their budget deficits reduced applying the cost price principle to the extent possible.

(I) University Restaurants

In the university restaurants, food and other items are served at prices below their costs and so their expenditure is higher than revenue and the consequent budget deficit is borne by the university. Due to inflation, cost prices have increased all around by 150 percent. There is the scope of increasing the food prices in the university restaurants by 100 percent, but we recommend only 50 percent rise in the prices of food and other items. This will increase their revenue by 148,479 J.D. per year. To that extent, their deficit will decline and the burden of deficit borne by the university and their subsidy to that extent will also fall, but still the deficit of the magnitude of 157,783 J.D. will remain. Of course, program for economizing expenditures in restaurants also should be undertaken.

(II) Model School Run By The University.

Yarmouk university runs the model school which has classes from K.G to the 12th standard. The school is running into the deficit of 132,666 J.D. We recommend the rise in tuition fees by 30 percent. This step will increase revenue by 69,356 J.D. and will reduce their deficit by half the amount. The corresponding deficit in the university budget also will decline. This shows that subsidization of tuition fees will continue, but the rate of its subsidization would fall.
(III) Low Rents In The Students Hostel

Hostel facilities at low rents have been given to women students to encourage and help them in having the benefits of higher education. But now when cost prices and rents have increased all around and when the tradition of women's participation in modern education has established itself, it is now time to double the rents in the students hostel to lessen its deficits. At present, the revenue from rent in the hostel is of the magnitude of 117497 J.D. so the university will get the same amount as additional revenue if rent are doubled for hostel accommodation. Despite this deficit of the magnitude of 137596 J.D. will remain.

Now let us examine the problem of over expansion of the non-academic staff.

(5) Over Expansion Of The Non-Academic Staff.

It is widely accepted that the strength of the non-academic staff should not exceed the ratio of 1.5 to the teaching staff. Here we are not taking into account the non-academic staff in the faculties as the problem, as their number is within limit. We are referring to the non-academic staff which works as the central staff and their over-expansion has created a serious problem. According to the above mentioned principle, their number should not exceed 932, but their total strength at present is 1545. So 613 employees were surplus. Hence salaries (including allowances) of the non-academic staff constitute about 32 per cent of the total expenditure and 36 per cent of recurrent expenditure of Yarmouk University. By any standards, this is a very high percentage. Elsewhere in this very chapter, we have shown the ways of lessening some 317 persons from the non-academic staff in detail which will save about 1072366 J.D. annually.

As there is prevalent disguised unemployment in the central staff of the university, the work of the removed persons can be done by the surplus
members from the central staff by being moved from one department to the other department. So the work and services will not suffer at all and the deficit of the university will diminish by 1072366 J.D.

Planning, Programming And Budgeting System.

So we would like to recommend the replacement of the line-item budgeting system by the planning, Programming and Budgeting System in Yarmouk University. This system which is, in short, known as PPBS, is the most rational and scientific version of all systems developed until now. In many organizations, dissatisfaction with traditional line-item budgeting system led to the adoption of performance budgeting. Performance budgeting concentrated on unit costing and excluded alternative costing approaches which could provide a link with the goals and objectives of the organization. There was found concern for output, but hardly any effort was exerted to link output with goals and objectives of the organization. But the emergence of programme budgeting filled in the missing gap between performance budgeting and PPBS and thus it proved to be a bridge between the two and thus emerged the most rational version of budgeting system which brings the elements of planning and programming to work on budgeting, thus evolving an integrated system of planning, programming and budgeting. In performance budgeting, planning was neglected and so assessment of output results could not be done properly but programme budgeting articulated programme objectives and developed measures in terms of output to assess the objectives. But programming did not devote due attention to the analysis of the alternatives for making the selection of the programme possible. PPBS is bereft of these deficiencies except that it is little costly and time-consuming but it is highly advantageous in achieving rational and economical allocation of resources which minimizes costs and maximizes goals and objectives-satisfaction. It
is a policy-oriented and decision-making system which helps policy makers in fulfilling their duties and responsibilities with utmost care and best results. We would like to give here a diagram from a very useful book "Effective Financial Management in Public and Non-Profit Agencies" by Jerome B. Makinney to explain in the words of the author himself the working of PPBS:
Before PPBS can be initiated, an institution must develop an analytical capability to examine in depth its objectives and the programs identified to achieve those objectives (see figure). There is a need to create an improved budgeting mechanism to facilitate broad program decision.
making and to translate it into budgeting outcomes. Figure 1-5 shows the steps that may be involved in developing a PPBS budget based on an assessment of needs and an evaluation of resource constraint. Goals and objectives are articulated. Next, an agency-wide program structure is developed, then programs are filled into the structure and analyzed after which a multi-year program budget and financial plan is constructed.

"Figure 1-5 clearly indicates that a budget is an instrument for implementing long-rang plans unlike traditional line-item budgeting in which budget decision making is primarily upward. PPBS decision making is mainly downward aggregative information flow process. In contrast to traditional budgeting system that takes a retrospective view in assessing what was done with resources, PPBS takes a prospective focus about the future impact of resource application. An unarticulated but implied premise of PPBS is that it is better to implement the right decision inefficiently than to implement the wrong decision efficiently". Till up now, we have examined the appropriateness of the line-item budgeting, zero-base budgeting, performance budgeting, planning, programming and budgeting system (PPBS) and have opted for PPBS to be adopted in public university. But here, we would like to draw attention to the important fact that all the above-mentioned systems are described as budgeting systems, that shows that in all systems, budgeting is considered to be the most vital part, as all programs require budgeting for their implementation, as we have already pointed out in the previous chapter that the budget is an effective tool in the kitty of financial management for acquiring, allocating and controlling of funds and for policy-making and for evaluation of results. When budgeting has to keep many goals and objectives and programs given by management in mind and as budgeting is found to be the central core of all the systems mentioned above, it becomes pertinent on our part to become more clear about the different roles that the budgeting and budget play.
The following chart from the same book as above clarifies the different roles and functions of budgets:

![Figure 5.2 Planning and budgeting](image)

Planning is done by Management which defines the goals and objectives and lays down the priorities. Then programming is also done by Management and accordingly the best available activities to realize the goals and objectives are selected by it which are to be completed within a specific time period.

From here, budgeting begins and it develops a detailed work plan to achieve the prescribed goals and satisfy the predetermined priorities in the given time period. It is here through Budget that Financial Management and Higher Management begin to work hand in glove for the successful realization of results as conceived in planning and programming. Then the actual results are compared with expected and estimated outcomes and the
variances between the two are rectified by FM by insisting for following the detailed work plan. This is the feed back mechanism. This controlling process is continuously going on through feed back mechanism and hence it takes the form of a loop. In this way, work plan is carried out through the control process which is activated by Financial Management Via budget process. Thus here we see how much important budgeting and budget are. But preparation of budget, financing of it, controlling, accounting, auditing, reporting, purchasing—all are done by Financial Management. Thus Financial Management plays an integrative role between financial processes and management processes.

Planning of goals and objectives and programming of activities to realize these goals and objectives are done by Higher Management. But these programmes and the necessary activities are turned into detailed work plans through budgeting by Financial Management and FM does continuous controlling also so that there are no variances or there are only tolerable minor variances between the estimated and actual outcomes. For this, FM employs the feedback mechanism for achieving the results according to the detailed work plan. Besides, FM, as we have already seen, carries out the other important functions of accounting, auditing, purchasing, and reporting. Then evaluation of final results is done by Higher Management in the light of goals and the objectives of the Institution. As for example, for a university, the final results will be expressed through the number of students who get Bachelor or Master or Ph.D. degree as a proportion of the enrolled students and the real quality of education that they imbibe, because that is the goal of the University. So this evaluation of ultimate and final results is done by Higher Management. Control is different from evaluation. Control by FM is concerned with following detailed work plan while Evaluation by IIM is concerned with the actual realization of the goals of the University. The
chart and the explanation given above highlight the pivotal role that FM plays.

But in the changing circumstances when public universities in Jordan are sandwiched between declining share in Tax-Revenue and stagnant self-Revenues on one hand and soaring expenditures and increasing budget deficits on the other, it is only basically transformed Financial Management system erected on modern scientific lines as advocated above that the universities can hope to come out from the doldrums and the present malaise in which they have plunged themselves. Lessening of cost and increase in revenue require (1) a new system of budgeting like PPBS, (2) change in the cash basis of accounting to accrual basis of accounting, (3) and efficient and integrated information system and (4) a new and greater role to FM to do its functions and carry out its responsibilities in a proper manner. This will enable FM to help Higher Management in taking right decisions at right times to avert the oncoming disaster before it is too late and to make possible the smooth sailing for the university so that it can devote itself whole-heartedly to the realization of the lofty goals for which it is meant without any financial or worldly worries.

Programming for Balanced Budgets for Yarmouk University for the Quinquennium:

For Yarmouk University, since 1993, there has been the commencement of chronic budget deficits and severe financial crisis. When we study the finances of Yarmouk University in the light of this framework, certain parameters catch our eye and we feel confident that if we work on these parameters, the budget deficit of the University can be eliminated and the University finances can be put on a sound footing. Let us first try to understand this framework and its parameters.
The chart, as taken from an interesting article by Derek Birch on "Programme Budgeting for Colleges" is presented below:

**Figure 5.3**

The Logic of Academic Department Budgets

```
<table>
<thead>
<tr>
<th>12000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student hours</td>
</tr>
</tbody>
</table>
```

ACS=10

```
\]
<table>
<thead>
<tr>
<th>12000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student hours</td>
</tr>
</tbody>
</table>
```

ALII 600

Lecturers required:
\[ \frac{A}{B \times C} \times 2 \]

Rank distribution (say)
- LI=0.5
- LII=0.5

Salary schedule
- LII 10,500
- LII 13,500

```
<table>
<thead>
<tr>
<th>Academic Staff cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>24,000</td>
</tr>
</tbody>
</table>
```

Support Staff ratios & salary schedules

```
| Total cost = 36,000 (say) |
```

Other cases by formulae

```
<table>
<thead>
<tr>
<th>Cost per student hour =</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,000 / 12,000 = 3.00</td>
</tr>
</tbody>
</table>
```

Let us understand that chart first because later, we wish to modify it for preparing the programme for removing budget deficits and having balanced budgets for coming 5 years.

To begin with, we may start with the student hours. Students hours are a product of the number of students and the required number of lectures that the student is expected to attend. In Yarmouk University as in other Universities in Jordan, there is a credit hours system which can be transformed into a student hours system. As for example, in a science faculty in Yarmouk University, a student is required to fulfil the condition
of 134 credit hours within 4 years to get the bachelor degree in science. If suppose, there are 3 credit hours for physics, it means that a student has to attend 3 lectures in physics per week for 4 years. We have to find out student hours for one year i.e. for two semesters. Every semester consists of 4 months and every month has got 4 weeks. So within one semester, 3 credit hours will mean that 3 lectures (each of one hour) have to be attended by the student per week and there are 16 weeks in each semester. So in two semesters, there will be 32 weeks. But 134 credit hours are to be completed within 4 years. So we have to divide 134 by 4 in order to get the required number of credit hours within one year. Then in order to transform the credit hours into student hours, we have to multiply \( \frac{134}{4} \) by 32 which is the number of weeks within two semesters in a year.

Here, we do not take into account the summer semester. So the formula for arriving at student hours from required 134 credit hours per year will be

\[
\text{student hours} = \frac{134}{4} \times 32 \text{ or } 134 \times 8 = 1072 \text{ (for science students)}.
\]

Now these 1072 student hours have to be fulfilled by one student within a year. So in order to get total student hours for all enrolled students, we have to multiply 1072 students hours by the total number of students. They call this total number of student hours as \( \Lambda \) which is nothing but the multiplication of N.S. (No-of-students) and required S.H. (student hours). Thus \( \Lambda = N.S. \times S.H. \).

Now for delivering lectures equal to the total number of student hours, a certain number of teachers will be required in accordance with the parameters of average class-size and the required number of teaching hours by every teacher on average. Among teachers in the University, as we know, there are various ranks like those of professor, Associate professor, Assistant Professor, Lecturer and Instructor. Minimum numbr
of lectures (each of one hour) that a professor is expected to deliver is 9 hours per week and for Associate professor and Assistant professor, it is 12 hours while for the lecturers, it is 15. If we take the average, it is 12 hours per week. So for 32 weeks of 2 semesters, the total average workload for each teacher will be $12 \times 32 = 384$. Some optimum class-size satisfying the quality and quantity criteria may be fixed up. They name class-size as $B$ and the total number of required lecture hours by a teacher within a year by $C$. We may name class-size as C.S. and total number of teaching ours as TTI1 or T11. So we get the formula for finding out the required number of teachers to teach for total student hours as given below:

\[
\text{Required number of teachers } RNT = \frac{\Lambda}{B \times C}
\]

Where $\Lambda$ = Total No. of student hours.

$C$ = Total teaching hours for a teacher within 2 semesters.

$B$ = Average class-size i.e the no. of students attending a class.

In order to understand this formula $\frac{\Lambda}{B \times C} = NT$, we may shift $C$ to the right side of the equation so that we get

\[
\frac{\Lambda}{B} = C \times NT
\]

Now the right side of the equation gives us the total number of teaching hours within a year, as $C$ represents total contact hours or total teaching hours for one teacher while $NT$ shows the total number of required teachers.

When we divide $\Lambda$ (total no. of student hours) by $B$ (class-size), $\frac{\Lambda}{B}$ gives us the total number of required teachers in terms of student hours which is also given by the right side $C \times NT$. Thus it can be seen that the
equation \( \frac{A}{B \times C} \) is the apt formula for finding out the required number of teachers for a given number of students in the light of the parameters of class-size, credit hours and the work load of teaching for the teachers.

After finding out the total number of required teachers, we have to arrange their number according to rank in the light of the ratios for distribution among them. Then we multiply the number of each category of teachers by its respective salary and thereby we get total salary cost of teachers.

Then in accordance with the given ratio in relation to the teaching staff, we take into account the number of research assistants and multiply their number with their salary which gives us total cost for research assistants.

When we add this cost of research assistants to the total salary cost of teachers, we get the total annual cost of the academic staff.

Now we have to take into consideration the cost of the materials used by the students, teachers and the non-teaching staff in the faculty. Some ratio linked with the number of students may be taken. But this ratio may be higher in the science faculty and may be low in the Economics faculty. Accordingly, the materials cost can be calculated for each faculty or department whatever the cost centre or the responsibility centre may be. We have taken the materials cost ratio in relation to the Direct cost of the faculty.

Then we have to take into account the support staff within the faculty. It is the non-academic staff which does the supporting work to the
teachers and the students. Here the central staff outside the faculty, but providing common services and facilities for all faculties has not been taken into consideration. Here only the non-teaching and non-academic staff within the faculty which has been taken stock of. The number of the non-academic staff should be according to some ratio of the number of teachers. Their number will be multiplied by their respective average salaries. Thus we get the cost of support staff.

Now the cost of the support staff and the materials cost will be added to the total of the academic staff cost in order to arrive at total cost within the faculty. When this total cost is divided by the number of students, we get the annual average cost per one student. Thus the total direct programme cost for any number of students can be found out by multiplying average cost per student by the respective number of students.

Then these costs can be compared with incomes. If costs are higher than incomes, the values of the parameters mentioned above may be changed and thereby costs reduced and efforts can be made to increase incomes also so that both the ends may meet resulting into a balanced budget and the instructional programme can be carried out in practice with smoothness and ease.

This process of adjustment between cost and revenue through working on relevant parameters has been also shown in the form of a chart (derived from Clark and Huff and Printed in the article mentioned above) which is given below:
In the light of our above elucidation, the chart becomes self-explanatory.

**Balance Between Income and Cost**

Then Derech Birch has also given an equation showing balance between total income and total cost as follows:

\[ y = a + \sum_{i=1}^{n} b_i x_i \]

where
$y = \text{Total Income of the cost centre. }$

$a = \text{Fixed cost.} $

$x_i = \text{The indicator of activity like the no of students, number of teaching} \$

$\text{hours, no. of teachers, no. of non-academic staff, student hours etc.} $

$b_i = \text{Shows the effect of change of one unit of x}$

$\text{As x may denote many factors and so the number of factors may be}$

$\text{from 1 to n.}$

$\sum_{i=1}^{n} b_i x_i \text{ Denotes the total effect of many factors of activity.}$

$y = \text{budgeted entitlement of income.}$

Thus income $y$ is shown to cover all costs including fixed costs too.

At faculty level, we have taken $y$ to be revenue from student Tuition Fees.

Now from my experience and also from observation of the finances of Yarmouk University, I find 3 or 4 important parameters on which we can work to increase revenue and reduce expenditure so that the budget deficit of the yarmouk university can be either completely eliminated or reduced considerably. For doing this, we have to change the format of the above-mentioned framework though working on the same fundamentals as given in that framework.

Now in our strategy, we wish to take faculty as a unit and not the department and we want to make each faculty self-sufficient so that from the revenues of the student fees, all costs-direct as well as the Indirect costs can be met.

The cost of the central staff outside the faculty, but working for the University as a whole, can be met from share in tax-revenue and self-revenue (without tuition fees). So, total cost and total revenue of each
faculty must be made equal. Total revenue of the faculty is the product of the number of students and the tuition fees per student for one year (two semesters). Tuition fees are fixed and they have not been changed for the last many years for bachelor students though inflation has reduced the value or purchasing power of money appreciably. Since 1986, the cost of living index has increased 2.5 times and so tuition fees for bachelor students can be increased at least 1.5 times. Also we have observed that due to the very strict policy of admission for the students, the number of admissions have fallen. The decrease in the number of students generally increases the cost per student. So we would like to recommend to relax somewhat the policy of admission so that the consequent increase in the number of students may reduce the cost per student and increase revenue via collection of more tuition fees.

So in order to make the total cost of the faculty equal to the total of student fees, we consider the following equation:

\[ \text{Total cost (T.C.) = Total Revenue of the faculty at present.} \]
\[ = \text{No. of students(N.S) \times tuition fees per student(B.F.)} \]

Thus \( T.C. = N.S. \times B.F. \)

or

\[ \frac{T.C.}{B.F.} = N.S. \]

\[ N.S. = \frac{T.C.}{B.F.} \]

F.G. stands for tuition fees for bachelor students:

But we recommend tuition fees to be 1.5 of present B.F.

So our equation will be \( N.S. = \frac{T.C.}{B.F. \times 1.5} \).

So this equation will give that number of students which would make the total student fees equal to total cost (direct cost + indirect cost)
of the respective faculty. This will give us the required number of students which will make the total revenue of the faculty equal to its total cost. So if the required number of students is found to be more than the present number of students, then the number of students should be increased. But if the required number of students is found to be less than the present number of students, then the number of students should not be decreased, because it is the effect of another parameter that we use here and it is the parameter of increasing the tuition fees. In this situation surplus may be created which may be put in reserves. Then we evolve a formula for finding out the class-size in relation to a new number of total students given by our equation for finding out the ideal number of students to meet the total cost of the faculty by tuition fees.

We have already discussed the formula \[ \frac{A}{B \times C} \] for arriving at the required number of teachers \( N.T. \) to meet total students hours \( A \).

Here \( A = N.S. \times S.H \) where \( N.S. = \text{No. of students} \).

\( S.H. = \text{Required hours} \).

and \( B = \text{class-size} \)

and \( C = \text{Teaching (or contact) hours of each teacher} \).

\[ \frac{A}{B \times C} = \frac{N.S. \times S.H}{C.S. \times T.H.} = N.T. \text{ (required No. of teachers)} \]

\[ \therefore N.S. \times S.H. = N.T. \times C.S. \times T.H. \]

We have \( N.T. \times C.S \times T.H. = N.S. \times S.H. \).

Taking \( N.T. \) and \( T.H. \) to other side, we get

\[ C.S. = \frac{N.S. \times S.H.}{N.T. \times T.H.} \]
Where

C.S. = class-size.

N.S. = No. of students.

S.H. = Student Hours of each student for two semesters.

N.T. = No. of teachers (actual).

T.H. = Teaching hours for each teacher for two semesters.

Here, we take the actual no. of teachers into account, because we have got required no. of students for these teachers.

Thus we have got two equations one for finding out the number of students which will make total revenue equal to total cost and another one to find the class-size when the actual no. of students is changed to the new no. of students given by the first equation.

Equation for finding the required no. of students to have a balanced budget for the faculty:

\[ N.S. = \frac{T.C.}{B.F. \times 1.5} \]  
where T.C. = Total cost of the faculty.

Equation for finding the class-size for the new no. of students:

\[ C.S. = \frac{N.S. \times S.H.}{N.T. \times T.H.} \]

We have explained above the logic and also the format for preparing the faculty budget and also our plan and programme to make faculties self-sufficient in respect of revenue (student fees) and total expenditure through working on certain parameters. Then with the help of the same logic, we have developed certain financial indicators which are given at the end in the final part of the charts prepared for each faculty. Certain facts disclosed by these indicators are very revealing. So we would like to draw attention specially to this part of our research. For their better perusal, we have showed them separately also in the form of a table for each faculty.
Actually we have utilized the above scheme of preparing the budget for planning and programming for removing deficits in the faculties thus making total cost and total revenue (from tuition fees) equal for them. This is ushering into self-reliance and balanced budgets. Our scheme is very simple. We have worked only on two parameters:

1. One is that of marginally increasing the tuition fees by 50 percent when cost of living index has increased by more than 150 percent since 1986:

2. Another one of increasing the number of students.

If the number of the students is not increased, tuition fees will have to be increased by a greater percentage than our proposed increase of 50 percent. If suppose, fees are not increased at all and only the number of students is increased, then it will have to be increased by a very large number making the class-size unviable which may affect the quality of Education.

So as a compromise solution we have advocated both-fees rise and increase in the number of students.

Here we have taken into account only Bachelor students and not Master students in the faculties. The number of Master students is not large in these four faculties and their tuition fees have been recently increased considerably since October 1996. Many students are old ones and so fees-rise does not apply to them, as it would apply to fresh students. So in future, their number is likely to fall. So to take into consideration their present number and their high tuition fees, would have given a false picture of the actual state of affairs in this regard. Hence we have not covered them in our analysis.

200
In the Institute of Archaeology and Anthropology, there are only M.A. students and no bachelor students. The cost per student is very high, but as fees for M.A. students are also high, we have suggested only for the increase in the number of students and not for the rise in fees to meet the deficit.
Figure 5-5

The Logic of Preparing Institute Budget for Archaeology & Anthropology

<table>
<thead>
<tr>
<th>NS</th>
<th>Total Student Hours</th>
<th>26,323.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>Total Teaching Hours</td>
<td>704.0</td>
</tr>
<tr>
<td></td>
<td>No. of Teachers Required</td>
<td>38.0</td>
</tr>
<tr>
<td></td>
<td>No. of Students</td>
<td>1,574.0</td>
</tr>
<tr>
<td></td>
<td>Total Cost</td>
<td>411,143.0</td>
</tr>
<tr>
<td></td>
<td>Total cost per student</td>
<td>900.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank</th>
<th>No.</th>
<th>Salary</th>
<th>Total Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>3</td>
<td>16462</td>
<td>43,862</td>
</tr>
<tr>
<td>Associate Prof</td>
<td>7</td>
<td>11,411</td>
<td>79,877</td>
</tr>
<tr>
<td>Assistant Prof</td>
<td>11</td>
<td>679</td>
<td>6,179</td>
</tr>
<tr>
<td>Instructor</td>
<td>1</td>
<td>679</td>
<td>6,179</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td></td>
<td>37,951</td>
</tr>
</tbody>
</table>

| No. of Research Assistants | 7 |
| Salary | 4,362 |

<table>
<thead>
<tr>
<th>Rank</th>
<th>No.</th>
<th>Salary</th>
<th>Total Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Assistants</td>
<td>22</td>
<td>4,362</td>
<td>93,246</td>
</tr>
</tbody>
</table>

| Material Cost | 43481.0 |
| Total Direct Cost | 20,096.0 |
| Total Indirect Cost | 34,222.0 |
| Grand Total Cost | 411,143.0 |
| Total Cost | 411,143.0 |
| Cost per student | 900.0 |

| No. of Students | 1,574.0 |
| Actual Cost per Student | 900.0 |

| No. of Students | 1,574.0 |
| Actual Cost per credit hour | 50.0 |

| Actual Cost per credit hour at present | (900.0 / 18) = 50.0 |

| Actual Cost per Student per year at present | 900.0 |

| No. of Students | 122.0 |
| Actual Cost per credit hour at present | (900.0 / 18) = 50.0 |

| Actual Cost per credit hour at present | (Cost per student / 18) = (3372 / 18) = 187.0 |

262
Institute of Archaeology and Anthropology

(Amounts in J.D.)

Cost for the Institute

(1) Annual cost per student at present - 3372
(2) Cost per credit Hour at Present - 187

Payment by the Student

(1) Annual Payment by the student at present - 900
(2) Tuition Fees per credit Hour - 50

Proposed scheme to Remove Deficit

(1) a- Annual cost per student - 900
   b- Annual payment by the student - 900
(2) Proposed Tuition Fees per credit hour - 50
(3) Number of the students to be increased to 457 from the present 122.

In the Institute of Archaeology and Anthropology only post-graduate students study and at present, their number is only 122. The annual cost per student at present is 3372 J.D. and cost per credit hour is 187 J.D. But the students pay 900 J.D by way of tuition fees per year. Tuition fees per credit hour is 50 J.D. Annual deficit is 301643 J.D.

To meet this deficit, we have not suggested any rise in fees, because their fees were increased as for all Master students from the academic year 1996-97. Hence we have advocated the increase in the number of students to reach the level of 457 students from its present number of 122 students so as to cover the deficit.
Figure 5-6
The Logic of Preparing Faculty Budget for Applied Engineering

No. of Students

<table>
<thead>
<tr>
<th>Course</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td>137</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of Teachers Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>137</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank</th>
<th>No</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>1</td>
<td>15629</td>
</tr>
<tr>
<td>Associate Prof.</td>
<td>2</td>
<td>9570</td>
</tr>
<tr>
<td>Assistant Prof.</td>
<td>28</td>
<td>7418</td>
</tr>
<tr>
<td>Instructors</td>
<td>1</td>
<td>7418</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>28629</td>
</tr>
</tbody>
</table>

Salary of Research Assistants

<table>
<thead>
<tr>
<th>No</th>
<th>Salary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Total Salary Cost of the Academic Staff

Total Salary Cost of Support Staff

<table>
<thead>
<tr>
<th>No</th>
<th>Average Salary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>4462</td>
<td>10464</td>
</tr>
</tbody>
</table>

Material Cost

<table>
<thead>
<tr>
<th>Hall</th>
<th>Direct Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>001254</td>
<td>83607</td>
<td>85868</td>
</tr>
</tbody>
</table>

Total Direct Cost

Total Indirect Cost

241 260

Grand Total Cost

69566

<table>
<thead>
<tr>
<th>No. of Students</th>
<th>Cost per student</th>
</tr>
</thead>
<tbody>
<tr>
<td>910</td>
<td></td>
</tr>
</tbody>
</table>

Total Cost

69566

Viable

No. of Students = Cost per student

910 = 764

Total Cost

69566

Total students Hours = Cost per student hour

263232 = 0.781

Cost per student = (764-50)-(30 6) = 23

Cost per credit hour = 23

Actual Cost per Student per year at present

Cost per student = (Cost per student -50) x (30 6) = (864-50) + (35) = 26 60 = 37 (Approx.)

Actual Cost per credit hour at present

Cost per credit hour = 23

207
Faculty of Applied Engineering

(Amounts in J.D.)

Cost for the Institute

(1) Annual cost per student at present - 864
(2) Cost per credit Hour at Present - 27

Payment by the Student

(1) Annual Payment by the student at present - 509
(2) Tuition Fees per credit Hour - 15

Proposed scheme to Remove Deficit

(1) a- Annual cost per student - 764
    b- Annual payment by the student - 764
(2) Proposed Tuition Fees per credit hour - 23
(3) No. of the students to be increased to 910 from 805.

At present, there are 805 bachelor students in the Faculty. Tuition fees per credit hour is 15 J.D which implies payment of 509 J.D. annually. But the annual cost per student for the Faculty is 864 J.D. which means 27 J.D. per credit hour. On account of this big difference in cost and payment, there is the deficit of 285921 J.D.

In order to eliminate this deficit, 50 per cent rise in tuition fees is recommended which means that fees per credit hour should be increased to 23 J.D from its present rate of 15 J.D. This implies annual payment of fees to be 764 J.D. This much fee-rise alone cannot cover the deficit and so we have also recommended the growth in the number of the students to 910 students in place of the present strength of 805 students. These two measures taken together will wipe out the deficit.
Figure 5-7 The Logic of Preparing Faculty Budget for Physical Education

<table>
<thead>
<tr>
<th>Rank</th>
<th>No.</th>
<th>Salary</th>
<th>Total Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>4</td>
<td>14456</td>
<td>57824</td>
</tr>
<tr>
<td>Associate Prof</td>
<td>8</td>
<td>10403</td>
<td>83224</td>
</tr>
<tr>
<td>Assistant Prof</td>
<td>8</td>
<td>6796</td>
<td>62368</td>
</tr>
<tr>
<td>Instructor</td>
<td>4</td>
<td>6342</td>
<td>25368</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td></td>
<td>124560</td>
</tr>
</tbody>
</table>

Salary Cost of Research Assistants

<table>
<thead>
<tr>
<th>No</th>
<th>Salary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6485</td>
<td>19454</td>
</tr>
</tbody>
</table>

Salary Cost of Support Staff

<table>
<thead>
<tr>
<th>No</th>
<th>Average Salary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>3011</td>
<td>69203</td>
</tr>
</tbody>
</table>

Total Indirect Cost

| 4048 |

Grand Total Cost

| 295094 |

Total Cost

| 355094 | No of Students = 360 |

Actual Cost per Student per year at present

\[
\text{Actual Cost per Student per year at present} = (\text{Cost per student} \times 33) = (1097 - 50) \times 33 = 31,722.72 \approx 31,722.72
\]

Actual Cost per credit hour per year at present

\[
\text{Actual Cost per credit hour per year at present} = \left( \frac{\text{Actual Cost per Student per year at present}}{360} \right) = \left( \frac{31,722.72}{360} \right) = 88.12 \approx 88.12
\]
Faculty of Physical Education
(Amounts in J.D.)

Cost for the Faculty

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual cost per student at present</td>
<td>1097 J.D.</td>
</tr>
<tr>
<td>Cost per credit Hour at Present</td>
<td>32 J.D.</td>
</tr>
</tbody>
</table>

Payment by the Student

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Payment by the student at present</td>
<td>314 J.D.</td>
</tr>
<tr>
<td>Tuition Fees per credit Hour</td>
<td>8 J.D.</td>
</tr>
</tbody>
</table>

Proposed scheme to Remove Deficit

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>a- Annual cost per student</td>
<td>471 J.D.</td>
</tr>
<tr>
<td>Annual payment by the student</td>
<td>471 J.D.</td>
</tr>
<tr>
<td>Proposed Tuition Fees per credit hour</td>
<td>12 J.D.</td>
</tr>
<tr>
<td>No. of the students to be increased</td>
<td>838 from</td>
</tr>
</tbody>
</table>

In the Faculty of physical Education, there are 360 bachelor students. Their tuition fees per credit hour is 8 J.D. which amounts to 314 J.D. per year. But the Faculty spends 1097 J.D. per student per year and its cost per credit hour comes to be 32 J.D. So its deficit is 282054 J.D. annually.

This deficit can be removed if the tuition fees per credit hour is increased to 12 J.D. from its present 8 J.D. and the number of the students is increased to 838 from its present 360 students.
Figure 5-8
The Logic of Preparing Faculty Budget for Arts

<table>
<thead>
<tr>
<th>Rank</th>
<th>No.</th>
<th>Salary</th>
<th>Total Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>34</td>
<td>4464</td>
<td>49168</td>
</tr>
<tr>
<td>Associate Prof</td>
<td>50</td>
<td>8063</td>
<td>520150</td>
</tr>
<tr>
<td>Assistant Prof</td>
<td>47</td>
<td>6964</td>
<td>406623</td>
</tr>
<tr>
<td>Instructor</td>
<td>20</td>
<td>4719</td>
<td>134380</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td></td>
<td>1550038</td>
</tr>
</tbody>
</table>

No. of Teachers Required: 151

Research Assistants: 6

Salary cost of Research Assistants:

<table>
<thead>
<tr>
<th>No.</th>
<th>Salary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4845</td>
<td>30770</td>
</tr>
</tbody>
</table>

Total Salary Cost of the Academic Staff: 206306

Salary Cost of Support Staff:

<table>
<thead>
<tr>
<th>No.</th>
<th>Average Salary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>4163</td>
<td>100332</td>
</tr>
</tbody>
</table>

Material Cost:

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Direct Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0006</td>
<td>1763263</td>
<td>13313</td>
</tr>
</tbody>
</table>

Total Direct Cost: 1763263

Total Indirect Cost: 34305

Gross Total Cost: 2176308

Total Cost: 2117558

Viable:

<table>
<thead>
<tr>
<th>Total Cost</th>
<th>No. of Students</th>
<th>Cost per student</th>
</tr>
</thead>
<tbody>
<tr>
<td>2117558</td>
<td>4496</td>
<td>471</td>
</tr>
</tbody>
</table>

Total Cost: 2117558

Cost per student hour = Total students hours / Total cost = 4496 / 2117558 = 0.0021 (Approx.)

Cost per credit hour: 12

Actual Cost per Student per year at present:

Total cost: 2117558

No. of students: 2911

Actual Cost per credit hour at present: (Cost per student - 50) + 33 = 20.51 (Approx.)
Faculty of Arts
(Amounts in J.D.)

Cost for the Faculty

(1) Annual cost per student at present - 727
(2) Cost per credit Hour at Present - 21

Payment by the Student

(1) Annual Payment by the student at present - 314
(2) Tuition Fees per credit Hour - 8

Proposed scheme to Remove Deficit

(1) a- Annual cost per student - 471
   b- Annual payment by the student - 471
(2) Proposed Tuition Fees per credit hour - 12
(3) No. of the students to be increased to 4496 from 2911.

In the Faculty of Arts, there are 2911 bachelor students which is a good number. But the annual cost per student is 727 J.D. per students and in terms of per credit hour, it is 21 J.D. But the students pay only 8 J.D. per credit hour which comes to the annual payment of 314 J.D. The deficit for the Faculty is 1203504 J.D. which is very high.

So 50 per cent rise in tuition fees is recommended making fees per credit hour to be 12 J.D. in place of present 8 J.D. This will make annual payment of fees by the student equal to 471 J.D.

Also there was no other alternative except to recommend the rise in the number of students to 4496 students from its present strength of 2911 students. These two measures together will eliminate the deficit.
Figure 5-9
The Logic of Preparing Faculty Budget for Science

<table>
<thead>
<tr>
<th>NS</th>
<th>NII</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Students</td>
<td>4791</td>
</tr>
<tr>
<td>Total Student Hours</td>
<td>5079932</td>
</tr>
<tr>
<td>No of Teachers Required</td>
<td>144</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank</th>
<th>No</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professors</td>
<td>94</td>
<td>50452</td>
</tr>
<tr>
<td>Associate Prof,</td>
<td>70</td>
<td>1620</td>
</tr>
<tr>
<td>Assistant Prof,</td>
<td>64</td>
<td>690</td>
</tr>
<tr>
<td>Instructor</td>
<td>7</td>
<td>179</td>
</tr>
<tr>
<td>Total</td>
<td>148</td>
<td></td>
</tr>
</tbody>
</table>

| 
|---|---|
| Total Staff | 148 |
| Support Staff | 33 |
| Teaching | 115 |

<table>
<thead>
<tr>
<th>No. of Students</th>
<th>491</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viable</td>
<td>No of Students</td>
</tr>
<tr>
<td>Total Students Hours</td>
<td>Total students Hours</td>
</tr>
<tr>
<td>5079932</td>
<td>4599922</td>
</tr>
<tr>
<td>5079932</td>
<td>4599922</td>
</tr>
<tr>
<td>Total Cost</td>
<td>1723198</td>
</tr>
<tr>
<td>Total Direct Cost</td>
<td>2199447</td>
</tr>
<tr>
<td>Total Indirect Cost</td>
<td>321934</td>
</tr>
<tr>
<td>Grand Total Cost</td>
<td>2404771</td>
</tr>
<tr>
<td>Total Cost</td>
<td>2404771</td>
</tr>
<tr>
<td>No of Students</td>
<td>Cost per student</td>
</tr>
<tr>
<td>4791</td>
<td>178</td>
</tr>
</tbody>
</table>

| Total Cost | 2404771 |
| Total Students Hours | Cost per student hour |
| 5079932 | 15 |
| 4599922 | 0 |
| Cost per student = (578-50)+(33*50) = 40 (Approx) |
| (Cost per student -50)+(33 50) = (1388-50) = 1338 |
| Actual Cost per Student per year at present | Present |
| Total cost | 2404771 |
| No of students | cost per student per year 1787 = 1388 |
| Actual Cost per credit hour at present |

210
Faculty of Science
(Amounts in J.D.)

Cost for the Faculty

(1) Annual cost per student at present - 1388
(2) Cost per credit Hour at Present - 40

Payment by the Student

(1) Annual Payment by the student at present - 385
(2) Tuition Fees per credit Hour - 10

Proposed scheme to Remove Deficit

(1) a- Annual cost per student - 578
   b- Annual payment by the student - 578
(2) Proposed Tuition Fees per credit hour - 15
(3) No. of the students to be increased from 1787 to 4291.

In the Faculty of science, there are 1787 bachelor students. The cost per student for the Faculty is 1388 J.D. which implies cost per credit hour to be 40 J.D. But the students pay 10 J.D as tuition fees per credit hour which means that they pay 385 J.D. per year. Due to this difference in cost and fees, the Faculty incurred the deficit of 1792476 J.D. in 1997.

In order to eliminate this deficit, our suggestion is to increase the tuition fees per credit hour from 10 J.D. to 15 J.D-50 per cent rise in fees and to increase the number of students to 4291 from its present strength of 1787 students to cover the deficit of 1792476 J.D.
Break - Even Analysis for Faculty Budgets

To make our analysis more clear, we now make use of break-even analysis for each of the four faculties and one institute. At the break-even point, total expenditure and total revenue become equal to each other and the budget becomes balanced.

Before discussing break-even analysis for the faculties with the help of their separate charts, we have thought it fit to explain the break-even chart in general so that its logic is properly grasped which may help in understanding faculty charts better.

**Figure 5.10**

Break-Even Chart

On the horizontal axis, number of students are represented and on the vertical axis, total tuition fees for the corresponding number of students are given. Indirect cost (fixed cost) is indicated by the straight line MQ which is parallel to the horizontal axis. OM or BF or cA indicate
fixed cost or indirect cost which does not change with the increase in the no. of students.

Direct cost (Variable cost) begins from the point M and it is expressed by the st. line MPN. OR represents the total fees for the corresponding no. of students.

In the above figure, we see that when the no. of students is OA, total tuition fees for OA students is AC and AC is the indirect cost also and DC is the variable or direct cost. So when the no. of students is OA, total fees are AC while indirect cost also is AC. So fees cover indirect cost. But direct cost DC remains uncovered and hence it indicates deficit. But when the number of students increases to e, revenue is eg, variable cost is hf and so fees cover eh fixed cost and gh part of variable cost.

But fg part of variable cost remains uncovered indicating that much deficit. But when the number of students increases to the level B, revenue from fees becomes equal to PB and total cost is also PB and hence total cost (Direct cost + indirect cost) and total revenue become equal at point P. At point P, the number of the students is OB.

The present situation is indicated by oe and for making total revenue and total cost equal, the number of the students should be increased to OB. Of course, fees also are proposed to be increased and here it is assumed to have been increased by 50 per cent. Thus in the circumstances of increase in fees by 50 per cent, the viable number of students (making revenue and cost equal) for the faculty will be considerably more than their actual number at present.
It should be made clear here that revenue can be shown to cover some part or whole of variable cost first and then when revenue increases (due to increase in the number of students) it can be shown to cover some part of fixed cost and then with further increase in revenue, it can be shown to cover full fixed cost after that it has covered full of variable cost. Thus after covering variable cost, increasing revenue provides greater and greater contributory margin to cover fixed cost. This is another method of saying the same thing. But between this approach and the approach that we have adopted above to explain the figure, the magnitude of deficit at each number of students remains the same and the same applies to the break-even point where there is no deficit.

But the above method that we have adopted, helps more in explaining the figure. In substance, there is no difference between the two.
Faculty of Physical Education

In the Faculty of Physical Education, there are 360 bachelor students and total revenue from their tuition fees is 113040 J.D. annually, but the total cost per year is 395094 J.D. and the deficit is 282054 J.D. In order to wipe out this deficit, 50 per cent increase in fees and the increase in the number of students by 478 (so that the total number of students reaches the level of 838) are some of the measures that are advocated.

In the above figure, we see that if the number of students reaches the level of 838 students, total of tuition fees cover the total cost-Direct as well as Indirect costs. Thus the faculty can reach the break-even point P as shown in the figure above where total revenue from tuition fees cover the total cost.
Break-Even chart for Faculty of Physical Education

Figure 5.11

Total Tuition Fees

No. of students

Direct cost

T. Std. fees

Deficit

Indirect cost (fixed cost)

45805

395094

0 100 200 300 360 400 500 600 700 800 838 900

No. of students

R

T.S.F.

D. cost
Faculty of Arts

At present, 2911 bachelor students study in the Faculty of Arts. Their aggregate tuition fees are 914054 J.D. while the total cost in the Faculty is 2117558 J.D. and hence the annual deficit is 1203504 J.D. We have advocated 50 per cent rise in tuition fees and the increase in the number of students by 1585 so that the total number of bachelor students increases to 4496 in place of present 2911 students. These two steps will increase revenue from tuition fees so as to make it equal to total cost.

In the above figure, we observe that when the number of students reaches the level of 4496, the Faculty can reach the break-even point P in the context of the rise in fees by 50 per cent. When inflation has increased costs by 150 per cent, 50 per cent rise in fees is very little. So these two measures can steer the way clear for Arts Faculty to have the balanced budget.
Figure 5.12  
Break-Even chart for Faculty of Arts
Science Faculty

At present 1787 students have been studying in science Faculty. But at this level, total cost is more than the revenues from the student fees and the deficit is of the magnitude of 1792476 J.D. If this deficit is to be removed, then tuition fees must be increased at least by 50 percent (and the number of the students must be increased) though the cost of living index is now 2.5 times of what it was in 1986. The value of money has decreased and costs all around have increased by 2.5 times, but the tuition fees for bachelor students have not increased at all. In real terms, fees have decreased by 150 per cent. But, here only 50 per cent increase has been advocated, but still deficit will continue unless the number of the students also is increased considerably. In the light of 50 per cent increase in tuition fees, our calculations show that the number of students should be increased by 2504 students and the total number of the students should be 4291. At this level, student fees will cover the total cost (Direct cost + Indirect cost) completely and the deficit will disappear.

In the Diagram, we observe that when the no. of students is increased to 4291, total cost and total revenue from students fees become equal and we reach the break-even point P. It has been shown that with the increase in the number of students, variable costs (Direct costs) also will increase and thus total costs will increase too, but the total revenue from the tuition fees also will increase due to the increase in the number of students. Thus total cost and total revenue become equal at Break-even point P.
Figure 5.13 Break-Even chart for Science Faculty T.S.F.
In the Institute of Archaeology and Anthropology, at present, 122 students study and they are all post-graduate (M.A.) students. Total of student fees is 109800 J.D. per year and total annual cost is 411443 J.D. and thus the deficit is 301643 J.D annually. We have not suggested any rise in fees, but have advocated the increase in the number of students, as there is already excess capacity in the Institute.

Our calculations show that the number of students should be increased to 457 students from its present strength of only 122 students. If the number of students reaches the level of 457, total student fees will cover total cost-Direct as well as Indirect and the Institute will reach the break-even point $P$ as shown in the above figure.
Figure 18-5 Break-Even chart for Archaeology & Anthropology

\[ - \frac{1}{5} \]

Total Tuition Fees

\[ ^{s}HLi \]

\[ ^{s}Y5- \]

Direct cost

T. Std fees

Deficit

Indirect cost (fixed cost)

0 100 122 300 400 457 500

No. of students

In hundred thousand J.D
Faculty of Applied Engineering

In the Faculty of Engineering, at present, 805 bachelor students have been studying. Revenue from their total tuition fees is 409745 J.D. while the total cost in the Faculty is 695666 J.D. So the deficit is of the magnitude of 285921 J.D. In order to remove this deficit, we suggest two measures—one to increase tuition fees by 50 per cent and the other one to increase the number of students by 105 students so as to reach the level of 910 students in place of the present number of 805 students. This will make total revenue from fees equal to total cost.

If we would have depended only on tuition fees rise for meeting the deficit, then higher fee rise would have been necessary. So besides suggesting mere 50 per cent rise in fees, we have advocated the measure of increasing the number of students also.

In the above figure, we see that at the present strength of 805 students, there is the big deficit, but with 50 per cent fees-rise and increase in the number of students by 105, the Faculty can reach the break-even point P where total revenues from tuition fees cover all total cost and the deficit is eliminated.
Figure 5-11 Break-Even chart for Faculty of Applied Engineering
Programming for Removing Budget Deficit and Ushering in to the Era of Balanced Budgets for Yarmouk University.

Budget deficit is the result of the excess of total expenditure over total revenue. So if the budget deficit is to be removed, then expenditure should be curtailed and revenue must be enhanced so as to make total revenue equal to total expenditure. Secondly, since 1993, budget deficit has become chronic for Yarmouk University and it has got an ascending trend. So this increase in revenue should be on a permanent footing and saving in expenditure due to reduction in it, also should have a built-in-character.

Saving in Expenditure

Let us first deal with saving in expenditure. On the expenditure side, we find one major drawback of employing too many people in the non-academic staff category. In the faculties, the proportion of non-academic staff is small and nobody says that they are excessive. But in the Central Administrative staff, they are double in number than what they are required to be. Present number of employees in the central staff is 1545. Actually, 50 percent of them are surplus. If they are removed, efficiency in administration and other services will not suffer. We may say that there is disguised unemployment to the extent of 50 per cent in the central staff of the University. Generally a ratio of 1.5 of the non-academic staff to the teaching staff has to be maintained. At present, the total strength of the teaching staff is 621 teachers. If we multiply 621 by 1.5, we get 932 as the number of the non-academic staff to be maintained as the central staff. At present, their total number is 1545 while their required number is 932 according to the formula mentioned above. So if we deduct 932 from 1545, we get 613 as surplus. There are reasonable ways of getting rid of
at least 317 employees from among them. For achieving it, the following steps may be taken:

**Reducing Retirement Age from 65 to 60 years**

1. Reducing the retirement age for the non-academic staff from its present 65 years to 60 years. As a result of this step, some 116 persons will get retired which will result into the annual saving of 519120 J.D for the University.

**One year contracts for Simple Types of Work May Be Ended**

2. There is the system of employing some persons on the contact basis for simple types of work. The contracts are for one year. These contracts may not be renewed henceforth. As a result, 102 persons will get removed which will save some 331846 J.D per year.

**Retired Persons May No Be Employed**

3. If the policy of not taking retired persons from military and social service is adopted and if they are also discontinued from their service at present, some 72 persons will get removed which will save some 1742 J.D per year.

**System of Monthly Payment Workers May Be Stopped**

4. Some persons work on the monthly payment basis. At present, their number is 27. If this system is abandoned, it will result in the saving of 46671 J.D per year.

Now total annual saving resulting from the taking of the above mentioned 4. steps will be of the magnitude of 1072366 J.D. Here it should be clarified that work done by these removed persons can be done by other surplus persons in the central staff by being moved from their departments to these departments.

If this is done and they will have to do it sooner or later, then there will be the saving of 1072366 J.D per year. This will be permanent saving in expenditure per year. In future, the University Management has to follow strictly the above mentioned ratio of 1.5 of the strength of the
Ways of Increasing Revenue

We observe that there are three obvious ways of increasing revenue namely,

1. Charging food at cost price in the University Restaurants.
2. Increasing tuition fees in the Model School by 30 percent so as to make it comparable with fees in other schools.
3. Increasing the rent in the student hostel, as it is at present at a very low level.

Let us briefly discuss them one by one.

1. The principle of cost-price charging for the University Restaurants:

At present, food in the University restaurants is served at subsidized rates. Their revenue is 296,958 J.D while their expenditure is 603,220 J.D.

Thus there is the deficit of 306,262 J.D. If restaurants increase their charges even by 50 per cent, they will get the additional revenue of 148,479 J.D per year approximately, though still their deficit will continue.

2. Increasing Tuition Fees in the Model School.

University runs the Model school which runs classes from K.G. to 12th standard. Though there was recent increase in tuition fees in the Model school, still there is scope of 30 per cent further increase in tuition fees so as to make it comparable to tuition fees in other schools. At present, the revenue from tuition fees in the Model school is 231,187 J.D while their expenditure is 363,853 J.D and so annual deficit at present is
If the tuition fees are increased by 30 per cent, increase in revenue will be of the magnitude of 69356 J.D. Still the deficit of 63310 J.D. will remain; but it would be about half of the previous amount.

(3) Increasing the Rent in the Student Hostel

Rents charged to the students in the University hostel are subsidized rents and hence they are very low. The annual revenue from rent is 117497 J.D while expenditure for Hostel is 255093 J.D. There is the scope of at least doubling the rent which will increase the revenue by the same amount of 117497 J.D.

Thus the total increase in revenue from these 3 sources will be as follows:

1. 148479 J.D from university restaurants.
2. 69356 J.D from the Model school.
3. 117497 J.D from the Hostel.

Total 335332 J.D

Now share from Tax-Revenue is 6363318 J.D.
Self-revenue and other revenues are 1605827 J.D.
so their total is 7969145 J.D.
Also the total increase in revenue from the above-mentioned 3 sources is 335332 J.D.
Hence total revenue available with the university is 8304477 J.D.

Now in accordance with our strategy, we made the programme for making faculties self-sufficient by working on the parameters of increase 23%
in fees by 50 per cent (in the light of increase in the cost of living index by 150 per cent) and increase in the number of students as required in different faculties. By way of illustration, we worked with 4 faculties and one Institute and showed for each of them the ways of programming the budget in such a fashion that revenue from tuition fees can cover their respective total expenditure. About the remaining faculties also, the same methodology and logistic can be applied. Thus all the seven faculties and one Institute will not need any financial resources to cover their total expenditure except when complete overhauling of any faculty is to be undertaken. It means that the university has not to worry about the expenditures of the faculties. So we can deduct the total expenditure of all the 7 faculties and one Institute from the total expenditure of the university which has to be financed by share from tax-revenue, self-revenue and other revenues and also increase in revenue made possible through 3 sources that we have indicated above.

Now total expenditure of the University in 1997 was

18203416 J.D.
- 08103937 J.D. expenditure of all 7 faculties and one Institute in
10099479 J.D. 1997 to be deducted.

So from this remaining expenditure, we have to deduct saving in expenditure made possible by lessening the strength of the non-academic staff by 317 persons. According to our estimate, saving on this account will be of 1072366 J.D. annually, as we have elucidated above. So we have to subtract this saved expenditure from the remaining total expenditure as shown above to be 10099479 J.D. Thus we get:
So now this total expenditure of the University is to be set against total revenue that will be available to the University. As we have estimated above, available total revenue for the university will be of the magnitude 8304477 J.D.

As revenue is less than expenditure, the budget deficit will be measured by deducting revenue of 8304477 J.D. from the remaining total expenditure of 9027113 J.D.

\[
\begin{align*}
\text{9027113 J.D.} \\
- \text{8304477 J.D.} \\
\text{722636 J.D.}
\end{align*}
\]

In 1997, the budget deficit of the university was 3090787 J.D. If the steps suggested by us would have been taken, the budget deficit would have been reduced to the smaller amount of 722636 J.D.

But we have developed this programme for lessening budget deficits substantially for future years at least up to the end of this century. We have made other recommendations also for changing the accounting system and the budget system of the University and installing the scientific information system and having the financial management structure on the modern lines.
Major Contributory Factors to the Budget Deficit in Yarmouk University

(1) There was no close linkage between academic planning and financial planning. Consequently, it was not realized fully that all academic decisions had their own resource implications attached with them.

(2) There was no proper planning and budgeting, and there was absence of coordination between the two. Budgetary allocations should have been linked with actual plans, but that was not done and there was no efficient monitoring of them.

(3) There was absence of effective financial control system which would ensure that all items of expenditure are covered by appropriations in the budget.

(4) External factors were not properly monitored and hence there was failure to realize the change in Government funding policy and its implications for the financial resources of Yarmouk University.

(5) There was no effective information system and there was not only information gap, but also a communications gap between different levels of management and between management and faculties and departments.

So the plans for recovery should have the following characteristics:

(1) Plans should be formulated after having full consultation within the university and thus they should enjoy a high degree of support from the rank and file.

(2) Management should provide leadership and should be ready to act decisively to carry out the recovery plans.

(3) Recovery plans meant to solve financial crisis are likely to be tough, but care should be taken that they are realistic and attainable.
Plans should be time-bound and there should be time scale for each constituent element and office-holders should be identified who would be held responsible for carrying out these element-wise plans in time.

Good information system is required at each level of management. In the formulation and also in the implementation of the Recovery plans, the aims and objectives of the University should not be lost sight of and efforts should be made to achieve results at minimum possible cost in a time-bound framework.

**Measures to Remove Deficit:**

In order to eliminate budget deficit, we have to plan to reduce expenditure and enhance income, as budget deficit is the excess of total expenditure over total income.

In terms of Break-even analysis, we can say that the financial level of Yarmouk University is on the left side of the break-even point. So in order to reach the break-even point where incomes and expenditures become equal, we have to move to the right of where we stand, thus moving nearer to the break-even point. This requires lessening of expenditure and reduction of cost and enhancement of revenue.

Here we describe some measures to reduce cost and expenditure and other measures to enhance revenue.

**Measures to Reduce Expenditure:**

The main reason for the budget crisis was that the university had not reduced its expenditure to the extent necessary to match its current and future income and this could not be made clear to higher management due to lack of proper financial reporting system.
The following measures to control expenditure may be suggested:

1. Freeze on all new appointments and so any post falling vacant may not be filled in.
2. Older staff can be persuaded to take early retirement.
3. Reductions in budgetary allocations for non-teaching staff.
4. The university should remove such departments which are high cost and where the number of students cannot be increased enough to meet this excess cost and which are not central to the main functions of teaching and research of the University.

Measures to increase income:

1. Increase in the number of students from within the country and also from abroad. This will increase revenue from tuition fees. Foreign students can pay higher fees.
2. University may conduct courses of short duration for vocational education and this will give more tuition fees than the cost of it.
3. University may enter into research contracts with industries and government enterprises and departments.
4. Staff-Consultancies also can give some income to the University.
5. Rent on student residences in the hostel may be increased.
6. In the university restaurants, food and other items may be charged at their cost-price and system of subsidization may be ended.
7. The basic principle of providing each item at its cost-price should be accepted by the university and put in practice strictly.